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)

JAN 2014
RECEIVED
ND OIL & GAS
DIVISION

Well File No.
22221

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

☐ Notice of Intent	Approximate Start Date	☐ Drilling Prognosis	☐ Spill Report
☑ Report of Work Done	Date Work Completed **December 15, 2013**	☐ Redrilling or Repair	☐ Shooting
☐ Notice of Intent to Begin a Workover Project that may Qualify for a Tax Exemption Pursuant to NDCC Section 57-51.1-03.	Approximate Start Date	☐ Casing or Liner	☐ Acidizing
		☐ Plug Well	☐ Fracture Treatment
		☐ Supplemental History	☐ Change Production Method
		☐ Temporarily Abandon	☐ Reclamation
		☐ Other **Well is now on pump**	

Well Name and Number				
Innoko 5301 41-12T				
Footages	Qtr-Qtr	Section	Township	Range
250 F S L 2350 F E L	**SWSE**	**12**	**153 N**	**101 W**
Field	Pool	County		
	Bakken	**McKenzie**		

24-HOUR PRODUCTION RATE

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

Name of Contractor(s)			
Address	City	State	Zip Code

DETAILS OF WORK

Effective 12/15/2013 the above referenced well is on pump.

Tubing: 2-7/8" L-80 tubing @ 10125

Pump: 2-1/2" x 2.0" x 24' insert pump @ 10056

Company **Oasis Petroleum North America LLC**		Telephone Number **281 404-9563**
Address **1001 Fannin, Suite 1500**		
City **Houston**	State **TX**	Zip Code **77002**
Signature Heather McCowan	Printed Name **Heather McCowan**	
Title **Regulatory Assistant**	Date **January 10, 2014**	
Email Address **hmccowan@oasispetroleum.com**		

FOR STATE USE ONLY

☑ Received	☐ Approved
Date 1/13/14	
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)

OCT 2013 RECEIVED ND OIL & GAS DIVISION

Well File No. 22221

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

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

Well Name and Number: Innoko 5301 43-12T			Spacing Unit Description: T153N R101W Sec 13 & 24
Operator: Oasis Petroleum North America	Telephone Number: (281) 404-9563		Field: Baker
Address: 1001 Fannin, Suite 1500			Pool: Bakken
City: Houston	State: TX	Zip Code: 77002	Permit Type: ☑ Wildcat ☐ Development ☐ Extension

LOCATION OF WELL

At Surface	Qtr-Qtr	Section	Township	Range	County
250 F S L 2350 F E L	SWSE	12	153 N	101 W	McKenzie

Spud Date	Date TD Reached	Drilling Contractor and Rig Number	KB Elevation (Ft)	Graded Elevation (Ft)
July 1, 2013	July 22, 2013	Nabors B25	2118	2093

Type of Electric and Other Logs Run (See Instructions)
N/A

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

Well Bore	String Type	String Size (Inch)	Top Set (MD Ft)	Depth Set (MD Ft)	Hole Size (Inch)	Weight (Lbs/Ft)	Anchor Set (MD Ft)	Packer Set (MD Ft)	Sacks Cement	Top of Cement
Surface Hole	Surface	9 5/8		2152	13 1/2	36			691	0
Vertical Hole	Intermediate	7		11117	8 3/4	32			793	2150
Lateral1	Liner	4 1/2	10198	21091	6	13.5				

PERFORATION & OPEN HOLE INTERVALS

Well Bore	Well Bore TD Drillers Depth (MD Ft)	Completion Type	Open Hole/Perforated Interval (MD,Ft) Top	Bottom	Kick-off Point (MD Ft)	Top of Casing Window (MD Ft)	Date Perf'd or Drilled	Date Isolated	Isolation Method	Sacks Cement
Lateral1	21122	Perforations	11117	21122	10477		09/07/2013			

PRODUCTION

Current Producing Open Hole or Perforated Interval(s), This Completion Top and Bottom, (MD Ft): Lateral 1 - 11117-21122
Name of Zone (If Different from Pool Name):

Date Well Completed (SEE INSTRUCTIONS)	Producing Method	Pumping-Size & Type of Pump	Well Status (Producing or Shut-In)
September 18, 2013	Flowing		Producing

Date of Test	Hours Tested	Choke Size	Production for Test	Oil (Bbls)	Gas (MCF)	Water (Bbls)	Oil Gravity-API (Corr.)	Disposition of Gas
09/18/2013	24	41.5 /64		1379	1080	4311	41.0 °	Flared

Flowing Tubing Pressure (PSI)	Flowing Casing Pressure (PSI)	Calculated 24-Hour Rate	Oil (Bbls)	Gas (MCF)	Water (Bbls)	Gas-Oil Ratio
	1107		1379	1080	4311	783

GEOLOGICAL MARKERS

Formation	MD (Ft)	TVD (Ft)
Dakota	5463	5463
Kibbey Lime	8391	8391
Charles Salts	8536	8536
UB	9160	9160
Base Last Salt	9227	9227
Ratcliffe	9278	9278
Mission Canyon	9459	9459
Lodgepole	10013	10013
False Bakken	10782	10718
Upper Bakken	10795	10727
Middle Bakken	10823	10743
Lower Bakken	10908	10783
Pronghorn	10936	10793
Three Forks	10972	10811

PLUG BACK INFORMATION

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

CORES CUT

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

Drill Stem Test

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

Well Specific Stimulations

Date Stimulated	Stimulated Formation	Top (Ft)	Bottom (Ft)	Stimulation Stages	Volume	Volume Units
09/07/2013	Bakken	11117	21122	36	90354	Barrels

Type Treatment	Acid %	Lbs Proppant	Maximum Treatment Pressure (PSI)	Maximum Treatment Rate (BBLS/Min)
Sand Frac		3765029	8782	37.7

Details
100 mesh: 128,174
40/70 White: 1,458,059
20/40 Ceramic: 2,178,796

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

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

Details

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

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

Details

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

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

Details

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

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

Details

ADDITIONAL INFORMATION AND/OR LIST OF ATTACHMENTS

I hereby swear or affirm that the information provided is true, complete and correct as determined from all available records.	Email Address	Date
	hmccowan@oasispetroleum.com	10/29/2013
Signature: Heather McCowan	Printed Name: Heather McCowan	Title: Regulatory Assistant

WELL COMPLETION OR RECOMPLETION REPORT - FORM 6
SFN 2468

1. This report shall be filed by the operator with the Commission immediately after the completion of a well in an unspaced pool or reservoir. Please refer to Section 43-02-03-31 of the North Dakota Administrative Code (NDAC).
2. This report shall be filed by the operator with the Commission within thirty (30) days after the completion of a well, or recompletion of a well in a different pool. Please refer to Section 43-02-03-31 NDAC.
3. The well file number, operator, well name and number, field, pool, permit type, well location(s), and any other pertinent data shall coincide with the official records on file with the Commission. If it does not, an explanation shall be given.
4. If a parasite string was used in the drilling of a well, the size, depth set, cement volume used to plug, and the date plugged shall be included. This information may be included in the "Additional Information" portion of the report or included as an attachment.
5. In the "Perforation & Open Hole Intervals" table, each borehole should be identified in the "Well Bore" column (vertical, sidetrack 1, lateral 1, etc.). On horizontal or directional wells, the following information shall be entered in the table if applicable: pilot hole total depth, kick-off point, casing windows, original lateral total depth, and all sidetracked interval starting and ending footages.
6. In the "Production" section, list all the current producing open hole or perforated intervals associated with the production rates reported. Oil, gas, and water rates and recoveries from perforations or laterals tested but not included in the completion should be included in the "Additional Information" portion of the report or included as an attachment.
7. In The "Date Well Completed" portion of the form please report the appropriate date as follows:
   - An oil well shall be considered completed when the first oil is produced through wellhead equipment into tanks from the ultimate producing interval after casing has been run.
   - A gas well shall be considered complete when the well is capable of producing gas through wellhead equipment from the ultimate producing zone after casing has been run.
   - For EOR or SWD wells, please report the date the well is capable of injection through tubing and packer into the permitted injection zone. Also, please report the packer type and depth and the tubing size, depth, and type. The packer and tubing type may be included in the "Additional Information" portion of the report.
8. The top of the Dakota Formation shall be included in the "Geological Markers."
9. Stimulations for laterals can be listed as a total for each lateral.
10. The operator shall file with the Commission two copies of all logs run. Logs shall be submitted as one digital TIFF (tagged image file format) copy and one digital LAS (log ASCII) formatted copy, or a format approved by the Director. In addition, operators shall file two copies of drill stem test reports and charts, formation water analyses, core analyses, geologic reports, and noninterpretive lithologic logs or sample descriptions if compiled by the operator.
11. A certified copy of any directional survey run shall be filed directly with the Commission by the survey contractor
12. The original and one copy of this report shall be filed with the Industrial Commission of North Dakota, Oil and Gas Division, 600 East Boulevard, Dept 405, Bismarck, ND 58505-0840.

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)

OCT 2013 RECEIVED ND OIL & GAS DIVISION

Well File No.
22221
NDIC CTB No.
2 22100

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

Well Name and Number	Qtr-Qtr	Section	Township	Range	County
INNOKO 5301 43-12T	SWSE	12	153 N	101 W	0 McKenzie

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

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

Name of First Purchaser	Telephone Number	% Purchased	Date Effective
Oasis Petroleum Marketing LLC	(281) 404-9573	100%	September 19, 2013

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

Transporter	Telephone Number	% Transported	Date Effective
Hiland Crude, LLC	(580) 616-2058	75%	September 19, 2013

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

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

Other First Purchasers Purchasing From This Lease	% Purchased	Date Effective
Other First Purchasers Purchasing From This Lease	% Purchased	Date Effective
Other Transporters Transporting From This Lease	% Transported	Date Effective
Prairie Field Services, LLC	25%	September 19, 2013
Other Transporters Transporting From This Lease	% Transported	Date Effective

Comments

I hereby swear or affirm that the information provided is true, complete and correct as determined from all available records.		Date
Signature: Annette Terrell	Printed Name: Annette Terrell	Title: Marketing Assistant

Above Signature Witnessed By:

Signature	Printed Name	Title
Dina Barron	Dina Barron	Mktg. Contracts Administrator

FOR STATE USE ONLY

Date Approved	OCT 11 2013
By	Eric Robertson
Title	Oil & Gas Production Analyst

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

Well or Facility No **22221**

Tight Hole **No**

OPERATOR

Operator	Representative	Rep Phone
OASIS PETROLEUM NORTH AMERICA LL	**Cody Jeannotte**	**(701) 580-7993**

WELL INFORMATION

Well Name
INNOKO 5301 43-12T

Inspector
Richard Dunn

Well Location	QQ	Sec	Twp		Rng	
	SWSE	**12**	**153**	**N**	**101**	**W**

County
MCKENZIE

Field
BAKER

Footages
250 Feet From the **S** Line
2350 Feet From the **E** Line

Pool
BAKKEN

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

PURCHASER / TRANSPORTER

Purchaser	Transporter
OASIS PETROLEUM MARKETING LLC	**HILAND CRUDE, LLC**

TANK BATTERY

Single Well Tank Battery Number :

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

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

DETAILS

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

Start Date	**9/10/2013**
Date Approved	**9/12/2013**
Approved By	**Richard Dunn**

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. **22221**

SEP 2013 RECEIVED ND OIL & GAS DIVISION

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

- [x] Notice of Intent — Approximate Start Date: **September 10, 2013**
- [ ] 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
- [x] Other: **Change well status to CONFIDENTIAL**

Well Name and Number				
Innoko 5301 43-12T				
Footages	Qtr-Qtr	Section	Township	Range
250 F S L 2350 F E L	SWSE	12	153 N	101 W
Field	Pool	County		
~~Willowcreek~~ BAKER	Bakken	McKenzie		

24-HOUR PRODUCTION RATE

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

Name of Contractor(s)			
Address	City	State	Zip Code

DETAILS OF WORK

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

OFF CONFIDENTIAL 3/11/14

Company	Telephone Number
Oasis Petroleum North America LLC	**281-404-9563**
Address: **1001 Fannin, Suite 1500**	
City: **Houston**	State: **TX** / Zip Code: **77002**
Signature: Heather McCowan	Printed Name: **Heather McCowan**
Title: **Regulatory Assistant**	Date: **September 10, 2013**
Email Address: **hmccowan@oasispetroleum.com**	

FOR STATE USE ONLY

- [ ] Received
- [x] Approved

Date: 9/12/13

By: Alice D. Webber

Title: Engineering Technician

Scientific Drilling
7327 West Barton Road
Casper, WY 82604
(307)-472-6621 Fax (307) 472-5439

Survey Certification

Operator	Oasis Petroleum
Well Name & No.	INNOKO 5301 43-12T
County & State	McKenzie County, ND
SDI Job No.	410713K29702
Rig	Nabors B25
Survey Date	2-Jul-2013

I, Seth M. Burstad, having personal knowledge of all the facts, hereby certify that the attached directional survey run from a measured depth of 100 feet to a measured depth of 2128 feet is true and correct as determined from all available records.

Seth Burstad
Signature

18-Jul-2013
Date

Seth M. Burstad
Rockies Region Well Planner
Scientific Drilling - Rocky Mountain District

Oasis Petroleum

McKenzie County, ND
INNOKO
INNOKO 5301 43-12T

OH

Design: OH

Standard Survey Report

18 July, 2013

Scientific Drilling

www.scientificdrilling.com

Scientific Drilling International

Survey Report

Company:	Oasis Petroleum	**Local Co-ordinate Reference:**	Well INNOKO 5301 43-12T
Project:	McKenzie County, ND	**TVD Reference:**	GL 2393' & KB 25' @ 2118.00ft (Nabors B25)
Site:	INNOKO	**MD Reference:**	GL 2393' & KB 25' @ 2118.00ft (Nabors B25)
Well:	INNOKO 5301 43-12T	**North Reference:**	True
Wellbore:	OH	**Survey Calculation Method:**	Minimum Curvature
Design:	OH	**Database:**	Casper District

Project McKenzie County, ND

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

Site INNOKO, SEC 12 T153N R101W

Site Position:		**Northing:**	410,351.35 usft	**Latitude:**	48° 4' 58.040 N
From:	Lat/Long	**Easting:**	1,207,628.30 usft	**Longitude:**	103° 36' 49.480 W
Position Uncertainty:	0.00 ft	**Slot Radius:**	13.200 in	**Grid Convergence:**	-2.32 °

Well INNOKO 5301 43-12T, 250 FSL 2350 FEL SEC 12 T153N R 101W

Well Position	**+N/-S**	0.00 ft	**Northing:**	410,351.34 usft	**Latitude:**	48° 4' 58.040 N
	+E/-W	0.00 ft	**Easting:**	1,207,628.30 usft	**Longitude:**	103° 36' 49.480 W
Position Uncertainty		0.00 ft	**Wellhead Elevation:**	ft	**Ground Level:**	2,093.00 ft

Wellbore OH

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	BGGM2013	7/3/2013	8.52	73.00	56,451

Design OH

Audit Notes:

Version:	1.0	**Phase:**	ACTUAL	**Tie On Depth:**	0.00

Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	25.00	0.00	0.00	149.40

Survey Program **Date** 7/18/2013

From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
125.00	2,153.00	Survey #1 Surface Gyro (OH)	SDI Standard Keeper 103	SDI Standard Wireline Keeper ver 1.0.3

Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
125.00	0.50	225.83	125.00	-0.38	-0.39	0.13	0.40	0.40	0.00
First SDI Gyro Survey									
225.00	0.47	239.05	224.99	-0.90	-1.06	0.23	0.12	-0.03	13.22
325.00	0.33	241.44	324.99	-1.24	-1.66	0.23	0.14	-0.14	2.39
425.00	0.16	239.33	424.99	-1.45	-2.03	0.22	0.17	-0.17	-2.11
525.00	0.05	80.81	524.99	-1.52	-2.11	0.23	0.21	-0.11	-158.52
625.00	0.35	160.05	624.99	-1.80	-1.96	0.55	0.34	0.30	79.24
725.00	0.38	122.31	724.99	-2.26	-1.58	1.14	0.24	0.03	-37.74
825.00	0.26	131.85	824.99	-2.59	-1.13	1.65	0.13	-0.12	9.54
925.00	0.31	81.19	924.99	-2.70	-0.69	1.97	0.25	0.05	-50.66

Scientific Drilling International

Survey Report

Company:	Oasis Petroleum	**Local Co-ordinate Reference:**	Well INNOKO 5301 43-12T
Project:	McKenzie County, ND	**TVD Reference:**	GL 2393' & KB 25' @ 2118.00ft (Nabors B25)
Site:	INNOKO	**MD Reference:**	GL 2393' & KB 25' @ 2118.00ft (Nabors B25)
Well:	INNOKO 5301 43-12T	**North Reference:**	True
Wellbore:	OH	**Survey Calculation Method:**	Minimum Curvature
Design:	OH	**Database:**	Casper District

Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
1,025.00	0.52	109.59	1,024.98	-2.81	0.00	2.42	0.29	0.21	28.40
1,125.00	0.87	124.28	1,124.98	-3.39	1.06	3.46	0.39	0.35	14.69
1,225.00	0.68	133.14	1,224.97	-4.22	2.12	4.71	0.22	-0.19	8.86
1,325.00	0.44	134.24	1,324.96	-4.90	2.82	5.65	0.24	-0.24	1.10
1,425.00	0.52	133.80	1,424.96	-5.48	3.43	6.46	0.08	0.08	-0.44
1,525.00	0.30	141.99	1,524.96	-6.00	3.92	7.16	0.23	-0.22	8.19
1,625.00	0.40	161.52	1,624.95	-6.54	4.19	7.76	0.15	0.10	19.53
1,725.00	0.11	126.48	1,724.95	-6.93	4.38	8.19	0.32	-0.29	-35.04
1,825.00	0.36	339.98	1,824.95	-6.69	4.35	7.97	0.46	0.25	-146.50
1,925.00	0.14	326.19	1,924.95	-6.29	4.17	7.54	0.23	-0.22	-13.79
2,025.00	0.07	214.54	2,024.95	-6.24	4.07	7.44	0.18	-0.07	-111.65
2,125.00	0.45	187.42	2,124.95	-6.68	3.98	7.78	0.39	0.38	-27.12
2,153.00	0.59	184.46	2,152.95	-6.93	3.96	7.98	0.51	0.50	-10.57
Last SDI Gyro Survey									

Design Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates +N/-S (ft)	Local Coordinates +E/-W (ft)	Comment
125.00	125.00	-0.38	-0.39	First SDI Gyro Survey
2,153.00	2,152.95	-6.93	3.96	Last SDI Gyro Survey

Checked By: _____ Approved By: _____ Date: _____

MWDsolutions

LEAM Drilling Systems
2027A Airport Road
Conroe, Texas 77301

MWD Survey Company: Leam Drilling Systems, LLC.
MWD Job Number: ND-130800
Well Name: Innoko **Number:** 5301 43-12T
County: McKenzie **State:** North Dakota
Customer: Oasis Petroleum

First Survey Date: 7/4/2013 **Final Survey Date:** 7/20/2013
Survey Start Depth: 2128 **Survey End Depth:** 21123
Survey Tool Type: Manned MWD
Survey Reference: True North
Declination: 8.04 °

MWD Surveyor Name: Randy Rakowitz

The data and calculations for this survey have been checked by me and conform to the calibration standards and operational procedures set forth by LEAM Drilling Systems, Inc. I am authorized and qualified to review the data, calculations and this report, and the 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.

Cody Baranowski
MWD Coordinator

MWDsolutions

MWD Solutions, Inc
12051 HWY 51E
Conroe, TX 77306

Survey Certification Form

I, Randy W. Rakowitz, an employee of MWD Solutions, Inc., hereby certify that on the dates beginning on 7/4/2013 and ending on 7/20/2013, I conducted or supervised the taking of an MWD Survey from a beginning depth of 2,128 ft. MD to an ending depth of 21,123 ft. MD; that the depth is true, correct, complete, and within the limitations of the tools as set forth by MWD Solutions, Inc., that I am authorized and qualified to make this report; that this survey was conducted in reference to True North with a declination of 8.04° with respect to the well Innoko 5301 43-12T located in McKenzie County , North Dakota as requested by Oasis Petroleum.

Randy W. Rakowitz
Sr. MWD Operations Coordinator

LEAM Drilling Systems, Inc. 2027A Airport Rd., Conroe, TX 77301

Survey Report

MINIMUM CURVATURE CALCULATION

Operator	Oasis Petroleum
Well Name	Innoko 5301 43-12T
Location	McKenzie County
Start Date	7/4/2013
End Date	7/20/2013
Direction	181.58°

MWDsolutions

SUR NUM	MD ft	INC °	AZM °	TVD ft	N-S ft	E-W ft	SECT ft	DLS °/100'
TIE IN	2128	0.59	184.46	2127.95	-6.86	4.04	6.74	0.51
1	2187	1.40	197.30	2186.94	-7.85	3.80	7.74	1.42
2	2280	1.50	175.30	2279.91	-10.15	3.56	10.05	0.60
3	2373	1.00	185.40	2372.89	-12.17	3.59	12.07	0.59
4	2466	1.10	184.50	2465.87	-13.87	3.44	13.77	0.11
5	2560	1.40	189.60	2559.85	-15.90	3.18	15.81	0.34
6	2653	1.10	243.70	2652.83	-17.42	2.19	17.35	1.26
7	2746	1.30	231.40	2745.81	-18.47	0.56	18.45	0.35
8	2839	1.20	236.20	2838.79	-19.67	-1.07	19.69	0.16
9	2933	0.90	243.90	2932.77	-20.54	-2.55	20.60	0.35
10	3026	1.00	258.30	3025.76	-21.03	-4.00	21.13	0.28
11	3119	0.80	258.50	3118.75	-21.32	-5.43	21.46	0.22
12	3212	1.00	269.60	3211.74	-21.46	-6.88	21.64	0.28
13	3306	0.90	280.40	3305.73	-21.33	-8.43	21.55	0.22
14	3399	0.90	288.00	3398.71	-20.97	-9.84	21.23	0.13
15	3492	1.00	294.30	3491.70	-20.41	-11.27	20.71	0.16
16	3585	0.80	306.10	3584.69	-19.70	-12.54	20.03	0.29
17	3679	0.90	304.70	3678.68	-18.89	-13.67	19.26	0.11
18	3772	0.90	305.80	3771.67	-18.05	-14.87	18.45	0.02
19	3864	0.70	4.50	3863.66	-17.06	-15.41	17.48	0.87
20	3957	0.90	17.70	3956.65	-15.80	-15.14	16.21	0.29
21	4051	1.10	89.90	4050.64	-15.10	-14.02	15.48	1.27
22	4144	1.10	92.90	4143.62	-15.14	-12.23	15.47	0.06
23	4237	0.90	101.50	4236.61	-15.33	-10.62	15.62	0.27
24	4331	0.50	93.40	4330.60	-15.50	-9.49	15.76	0.44
25	4424	0.40	88.10	4423.60	-15.51	-8.76	15.75	0.12
26	4517	0.40	75.00	4516.60	-15.42	-8.12	15.64	0.10

LEAM Drilling Systems, Inc. 2027A Airport Rd., Conroe, TX 77301

Survey Report

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Start Date	7/4/2013
End Date	7/20/2013
Direction	181.58°

MWDsolutions

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27	4610	0.30	77.90	4609.59	-15.28	-7.57	15.49	0.11
28	4704	0.10	64.80	4703.59	-15.20	-7.26	15.39	0.22
29	4797	0.20	57.00	4796.59	-15.07	-7.05	15.26	0.11
30	4890	0.30	71.40	4889.59	-14.91	-6.68	15.09	0.13
31	4983	0.10	62.70	4982.59	-14.79	-6.38	14.96	0.22
32	5076	0.50	15.70	5075.59	-14.37	-6.20	14.53	0.47
33	5170	0.70	55.30	5169.59	-13.64	-5.61	13.79	0.48
34	5263	0.30	163.40	5262.58	-13.55	-5.08	13.69	0.91
35	5356	0.60	153.40	5355.58	-14.22	-4.79	14.35	0.33
36	5450	0.30	175.70	5449.58	-14.91	-4.55	15.03	0.36
37	5543	0.30	200.50	5542.58	-15.38	-4.62	15.50	0.14
38	5636	0.90	213.70	5635.57	-16.22	-5.11	16.35	0.66
39	5729	1.00	212.60	5728.56	-17.51	-5.95	17.66	0.11
40	5822	1.00	210.10	5821.54	-18.89	-6.79	19.07	0.05
41	5916	0.50	243.40	5915.54	-19.79	-7.57	19.99	0.68
42	6009	0.90	247.20	6008.53	-20.25	-8.61	20.48	0.43
43	6102	1.10	252.30	6101.51	-20.80	-10.13	21.08	0.24
44	6196	1.40	320.00	6195.50	-20.20	-11.73	20.52	1.50
45	6289	1.90	345.80	6288.46	-17.83	-12.84	18.18	0.95
46	6382	2.50	6.60	6381.39	-14.32	-12.98	14.68	1.06
47	6475	2.00	6.10	6474.32	-10.70	-12.58	11.04	0.54
48	6568	1.50	351.80	6567.28	-7.88	-12.58	8.22	0.71
49	6662	1.20	345.70	6661.25	-5.71	-13.00	6.06	0.35
50	6755	0.50	38.00	6754.24	-4.44	-12.99	4.80	1.05
51	6848	1.10	201.70	6847.24	-4.95	-13.07	5.31	1.71
52	6941	1.20	213.10	6940.22	-6.60	-13.93	6.98	0.27
53	7035	1.00	232.80	7034.20	-7.92	-15.12	8.33	0.45
54	7128	0.90	233.90	7127.19	-8.84	-16.36	9.29	0.11
55	7221	0.80	255.30	7220.18	-9.43	-17.58	9.92	0.36

LEAM Drilling Systems, Inc. 2027A Airport Rd., Conroe, TX 77301

Survey Report

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Start Date	7/4/2013
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MWDsolutions

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56	7314	0.30	204.00	7313.17	-9.82	-18.30	10.32	0.71
57	7408	0.10	94.60	7407.17	-10.05	-18.32	10.55	0.37
58	7501	0.20	152.50	7500.17	-10.20	-18.17	10.70	0.18
59	7594	0.30	170.20	7593.17	-10.59	-18.05	11.08	0.13
60	7687	0.30	129.50	7686.17	-10.98	-17.82	11.47	0.22
61	7781	0.00	173.80	7780.17	-11.14	-17.63	11.62	0.32
62	7874	0.10	272.90	7873.17	-11.13	-17.71	11.62	0.11
63	7967	0.40	14.80	7966.17	-10.82	-17.71	11.30	0.46
64	8060	0.50	333.40	8059.17	-10.14	-17.81	10.63	0.36
65	8153	0.60	316.50	8152.16	-9.42	-18.33	9.93	0.20
66	8247	0.60	321.40	8246.16	-8.68	-18.97	9.20	0.05
67	8340	0.70	348.30	8339.15	-7.75	-19.39	8.28	0.34
68	8433	0.70	5.20	8432.14	-6.62	-19.45	7.16	0.22
69	8526	0.70	9.60	8525.14	-5.50	-19.31	6.03	0.06
70	8620	0.60	13.60	8619.13	-4.45	-19.10	4.98	0.12
71	8713	0.50	6.10	8712.13	-3.58	-18.94	4.10	0.13
72	8806	0.60	22.80	8805.12	-2.72	-18.71	3.24	0.20
73	8899	0.60	45.80	8898.12	-1.94	-18.17	2.44	0.26
74	8992	0.50	55.30	8991.11	-1.36	-17.49	1.85	0.15
75	9086	0.40	44.40	9085.11	-0.90	-16.92	1.36	0.14
76	9179	0.50	50.50	9178.11	-0.41	-16.38	0.86	0.12
77	9272	1.10	45.40	9271.10	0.48	-15.43	-0.05	0.65
78	9366	1.20	42.40	9365.08	1.84	-14.12	-1.45	0.12
79	9459	0.10	109.40	9458.07	2.53	-13.39	-2.16	1.25
80	9552	0.10	5.50	9551.07	2.58	-13.31	-2.22	0.17
81	9645	0.20	334.90	9644.07	2.81	-13.37	-2.44	0.13
82	9739	0.40	330.20	9738.07	3.25	-13.60	-2.87	0.21
83	9832	0.40	312.40	9831.07	3.75	-14.00	-3.36	0.13
84	9925	0.40	301.40	9924.07	4.13	-14.52	-3.73	0.08

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Survey Report

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MWDsolutions

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85	10018	0.40	287.70	10017.06	4.40	-15.10	-3.98	0.10
86	10111	0.80	291.30	10110.06	4.74	-16.02	-4.29	0.43
87	10205	0.80	265.20	10204.05	4.92	-17.28	-4.44	0.38
88	10303	2.30	210.30	10302.02	3.16	-18.96	-2.64	1.99
89	10335	6.80	199.10	10333.91	0.82	-19.90	-0.27	14.27
90	10366	12.00	200.10	10364.48	-3.94	-21.61	4.54	16.78
91	10397	16.20	201.50	10394.54	-11.00	-24.31	11.66	13.59
92	10428	21.20	202.20	10423.89	-20.22	-28.01	20.98	16.14
93	10459	23.50	203.30	10452.56	-31.08	-32.57	31.97	7.54
94	10490	25.70	204.00	10480.75	-42.90	-37.75	43.93	7.16
95	10521	25.80	205.40	10508.67	-55.14	-43.38	56.31	1.99
96	10552	27.50	203.80	10536.38	-67.78	-49.16	69.11	5.95
97	10583	30.20	202.90	10563.53	-81.51	-55.09	83.00	8.82
98	10614	32.00	199.10	10590.07	-96.46	-60.81	98.10	8.59
99	10645	35.00	197.30	10615.92	-112.72	-66.14	114.50	10.19
100	10676	38.20	197.80	10640.80	-130.33	-71.72	132.26	10.37
101	10707	41.40	200.10	10664.62	-149.09	-78.17	151.19	11.36
102	10739	44.10	200.50	10688.12	-169.46	-85.71	171.76	8.48
103	10770	47.50	201.00	10709.72	-190.24	-93.58	192.75	11.03
104	10801	51.50	201.20	10729.85	-212.23	-102.07	214.96	12.91
105	10832	55.80	200.50	10748.22	-235.56	-110.95	238.53	13.99
106	10863	59.70	199.20	10764.76	-260.21	-119.84	263.42	13.07
107	10894	63.50	200.50	10779.50	-285.86	-129.11	289.31	12.80
108	10925	64.70	201.50	10793.05	-311.89	-139.10	315.60	4.84
109	10956	67.40	201.90	10805.63	-338.21	-149.58	342.20	8.79
110	10987	71.50	201.20	10816.51	-365.20	-160.23	369.48	13.39
111	11018	75.10	200.50	10825.41	-392.95	-170.80	397.51	11.81
112	11049	79.30	199.40	10832.28	-421.35	-181.11	426.19	13.98
113	11080	84.00	198.90	10836.78	-450.32	-191.17	455.42	15.24

LEAM Drilling Systems, Inc. 2027A Airport Rd., Conroe, TX 77301

Survey Report

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MWDsolutions

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114	11134	89.30	198.00	10839.94	-501.44	-208.22	506.99	9.95
115	11165	89.90	197.80	10840.15	-530.94	-217.75	536.74	2.04
116	11196	90.70	197.50	10839.99	-560.48	-227.15	566.53	2.76
117	11228	91.30	196.10	10839.43	-591.11	-236.39	597.40	4.76
118	11258	91.50	194.70	10838.70	-620.02	-244.36	626.52	4.71
119	11289	91.60	193.30	10837.86	-650.09	-251.86	656.78	4.53
120	11321	91.70	191.10	10836.94	-681.35	-258.61	688.22	6.88
121	11352	92.20	190.40	10835.88	-711.79	-264.39	718.81	2.77
122	11383	92.70	189.40	10834.56	-742.30	-269.72	749.45	3.60
123	11414	92.90	187.80	10833.04	-772.91	-274.35	780.18	5.20
124	11445	92.70	186.60	10831.53	-803.63	-278.23	811.00	3.92
125	11476	91.50	185.00	10830.39	-834.45	-281.36	841.89	6.45
126	11506	90.50	183.80	10829.87	-864.36	-283.66	871.85	5.21
127	11537	89.00	182.20	10830.01	-895.31	-285.28	902.84	7.07
128	11568	89.30	181.00	10830.47	-926.29	-286.15	933.83	3.99
129	11598	89.60	181.00	10830.75	-956.29	-286.67	963.83	1.00
130	11691	89.60	179.20	10831.40	-1049.28	-286.83	1056.79	1.94
131	11783	88.50	178.00	10832.93	-1141.24	-284.59	1148.65	1.77
132	11876	88.00	178.80	10835.77	-1234.16	-281.99	1241.46	1.01
133	11968	89.40	178.80	10837.86	-1326.11	-280.06	1333.33	1.52
134	12061	89.40	178.80	10838.83	-1419.09	-278.12	1426.22	0.00
135	12154	89.60	180.60	10839.64	-1512.08	-277.63	1519.16	1.95
136	12246	90.30	180.40	10839.72	-1604.07	-278.43	1611.14	0.79
137	12339	90.10	179.70	10839.40	-1697.07	-278.51	1704.11	0.78
138	12432	90.80	179.60	10838.67	-1790.07	-277.95	1797.05	0.76
139	12525	91.30	178.80	10836.96	-1883.04	-276.65	1889.95	1.01
140	12618	90.10	179.70	10835.83	-1976.02	-275.43	1982.87	1.61
141	12710	88.40	180.60	10837.03	-2068.01	-275.67	2074.83	2.09
142	12803	88.40	180.30	10839.63	-2160.97	-276.40	2167.77	0.32

LEAM Drilling Systems, Inc. 2027A Airport Rd., Conroe, TX 77301

Survey Report

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143	12896	89.60	181.10	10841.25	-2253.95	-277.54	2260.74	1.55
144	12990	90.00	180.60	10841.58	-2347.94	-278.93	2354.74	0.68
145	13085	91.50	180.30	10840.33	-2442.92	-279.68	2449.71	1.61
146	13180	90.00	181.10	10839.09	-2537.90	-280.84	2544.68	1.79
147	13275	88.50	180.30	10840.33	-2632.89	-282.00	2639.66	1.79
148	13370	90.70	180.30	10841.00	-2727.88	-282.50	2734.63	2.32
149	13465	87.70	181.30	10842.32	-2822.85	-283.82	2829.60	3.33
150	13560	88.50	181.50	10845.47	-2917.76	-286.14	2924.55	0.87
151	13654	89.00	180.40	10847.52	-3011.73	-287.70	3018.52	1.29
152	13749	89.50	180.80	10848.77	-3106.71	-288.70	3113.49	0.67
153	13844	90.30	180.10	10848.93	-3201.71	-289.44	3208.47	1.12
154	13938	89.70	181.10	10848.93	-3295.70	-290.43	3302.46	1.24
155	14033	88.90	181.80	10850.09	-3390.66	-292.83	3397.45	1.12
156	14128	88.80	181.10	10852.00	-3485.61	-295.23	3492.43	0.74
157	14223	88.80	181.30	10853.99	-3580.57	-297.22	3587.41	0.21
158	14318	90.00	180.60	10854.99	-3675.55	-298.80	3682.39	1.46
159	14413	88.00	180.60	10856.64	-3770.53	-299.79	3777.36	2.11
160	14508	89.40	179.90	10858.80	-3865.50	-300.21	3872.31	1.65
161	14602	87.10	179.70	10861.67	-3959.45	-299.88	3966.21	2.46
162	14697	87.10	180.80	10866.48	-4054.32	-300.29	4061.06	1.16
163	14792	86.90	180.40	10871.45	-4149.19	-301.29	4155.92	0.47
164	14887	89.70	179.70	10874.27	-4244.14	-301.37	4250.83	3.04
165	14981	90.30	179.70	10874.27	-4338.13	-300.88	4344.78	0.64
166	15076	91.10	180.10	10873.10	-4433.13	-300.71	4439.73	0.94
167	15171	90.40	180.40	10871.86	-4528.12	-301.12	4534.70	0.80
168	15265	90.70	180.60	10870.96	-4622.11	-301.94	4628.68	0.38
169	15360	90.80	179.40	10869.72	-4717.10	-301.94	4723.63	1.27
170	15455	92.50	180.40	10866.98	-4812.05	-301.78	4818.55	2.08
171	15550	90.90	179.90	10864.16	-4907.01	-302.03	4913.47	1.76

LEAM Drilling Systems, Inc. 2027A Airport Rd., Conroe, TX 77301

Survey Report

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MWDsolutions

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172	15645	91.00	178.80	10862.59	-5001.99	-300.95	5008.38	1.16
173	15739	90.30	178.80	10861.52	-5095.96	-298.98	5102.27	0.74
174	15834	90.40	179.00	10860.94	-5190.94	-297.16	5197.16	0.24
175	15929	90.30	178.50	10860.36	-5285.92	-295.08	5292.04	0.54
176	16024	89.40	178.80	10860.61	-5380.89	-292.85	5386.92	1.00
177	16119	90.80	178.50	10860.44	-5475.86	-290.61	5481.79	1.51
178	16213	91.40	179.00	10858.64	-5569.82	-288.56	5575.66	0.83
179	16308	92.20	179.40	10855.65	-5664.76	-287.23	5670.53	0.94
180	16403	91.20	179.20	10852.84	-5759.71	-286.07	5765.41	1.07
181	16498	91.80	179.70	10850.35	-5854.67	-285.16	5860.31	0.82
182	16593	90.10	178.10	10848.77	-5949.64	-283.34	5955.19	2.46
183	16688	90.00	178.80	10848.69	-6044.60	-280.77	6050.05	0.74
184	16783	91.90	178.30	10847.12	-6139.55	-278.36	6144.90	2.07
185	16877	90.60	177.10	10845.07	-6233.45	-274.59	6238.65	1.88
186	16972	91.50	176.40	10843.32	-6328.28	-269.21	6333.30	1.20
187	17067	91.30	176.90	10841.00	-6423.09	-263.66	6427.92	0.57
188	17162	90.90	178.10	10839.18	-6517.98	-259.51	6522.66	1.33
189	17257	91.60	180.10	10837.11	-6612.94	-258.02	6617.54	2.23
190	17281	92.40	177.30	10836.27	-6636.92	-257.48	6641.49	12.13
191	17375	91.20	177.30	10833.32	-6730.77	-253.05	6735.18	1.28
192	17470	90.70	179.60	10831.74	-6825.71	-250.48	6830.02	2.48
193	17565	90.80	181.30	10830.50	-6920.70	-251.23	6924.99	1.79
194	17660	90.10	181.50	10829.75	-7015.66	-253.55	7019.99	0.77
195	17755	90.70	181.70	10829.09	-7110.62	-256.20	7114.99	0.67
196	17849	91.10	180.80	10827.61	-7204.59	-258.25	7208.97	1.05
197	17944	90.10	181.80	10826.62	-7299.56	-260.41	7303.96	1.49
198	18039	90.30	181.50	10826.29	-7394.52	-263.14	7398.96	0.38
199	18134	90.20	181.50	10825.87	-7489.48	-265.63	7493.96	0.11
200	18228	90.20	181.10	10825.54	-7583.46	-267.76	7587.96	0.43

LEAM Drilling Systems, Inc. 2027A Airport Rd., Conroe, TX 77301

Survey Report

MINIMUM CURVATURE CALCULATION

Operator	Oasis Petroleum
Well Name	Innoko 5301 43-12T
Location	McKenzie County
Start Date	7/4/2013
End Date	7/20/2013
Direction	181.58°

MWDsolutions

SUR NUM	MD ft	INC °	AZM °	TVD ft	N-S ft	E-W ft	SECT ft	DLS °/100'
201	18323	91.30	181.50	10824.30	-7678.42	-269.92	7682.95	1.23
202	18418	92.30	181.10	10821.32	-7773.35	-272.07	7777.90	1.13
203	18513	90.50	181.80	10818.99	-7868.29	-274.48	7872.87	2.03
204	18608	90.10	181.80	10818.50	-7963.24	-277.46	7967.86	0.42
205	18702	90.10	181.80	10818.33	-8057.19	-280.41	8061.86	0.00
206	18797	93.20	183.20	10815.60	-8152.05	-284.55	8156.80	3.58
207	18892	91.70	182.40	10811.54	-8246.85	-289.19	8251.69	1.79
208	18987	91.10	181.70	10809.22	-8341.76	-292.59	8346.65	0.97
209	19082	89.60	181.10	10808.64	-8436.72	-294.91	8441.65	1.70
210	19177	90.60	180.80	10808.47	-8531.71	-296.48	8536.64	1.10
211	19271	91.50	181.70	10806.75	-8625.67	-298.53	8630.62	1.35
212	19366	89.10	178.30	10806.25	-8720.65	-298.53	8725.56	4.38
213	19461	88.60	178.70	10808.16	-8815.59	-296.05	8820.41	0.67
214	19555	89.80	179.40	10809.47	-8909.57	-294.49	8914.30	1.48
215	19650	90.70	179.60	10809.05	-9004.56	-293.66	9009.24	0.97
216	19745	90.70	179.40	10807.89	-9099.55	-292.83	9104.17	0.21
217	19840	91.50	179.40	10806.07	-9194.53	-291.84	9199.08	0.84
218	19935	91.70	179.20	10803.42	-9289.49	-290.68	9293.97	0.30
219	20029	91.60	178.10	10800.71	-9383.42	-288.46	9387.81	1.17
220	20124	91.50	179.00	10798.14	-9478.35	-286.06	9482.64	0.95
221	20219	91.50	178.50	10795.65	-9573.30	-283.99	9577.49	0.53
222	20314	90.20	179.70	10794.24	-9668.27	-282.50	9672.39	1.86
223	20409	90.20	179.40	10793.91	-9763.27	-281.75	9767.32	0.32
224	20503	90.60	179.40	10793.26	-9857.26	-280.76	9861.25	0.43
225	20598	91.30	180.10	10791.68	-9952.25	-280.35	9956.19	1.04
226	20693	91.10	179.60	10789.69	-10047.22	-280.10	10051.13	0.57
227	20788	90.40	179.20	10788.45	-10142.21	-279.11	10146.05	0.85
228	20883	90.60	179.00	10787.62	-10237.19	-277.61	10240.96	0.30
229	20978	89.70	179.00	10787.37	-10332.18	-275.96	10335.86	0.95

LEAM Drilling Systems, Inc. 2027A Airport Rd., Conroe, TX 77301

Survey Report

MINIMUM CURVATURE CALCULATION

Operator	Oasis Petroleum
Well Name	Innoko 5301 43-12T
Location	McKenzie County
Start Date	7/4/2013
End Date	7/20/2013
Direction	181.58°

MWDsolutions

SUR NUM	MD ft	INC °	AZM °	TVD ft	N-S ft	E-W ft	SECT ft	DLS °/100'
230	21072	88.50	178.30	10788.85	-10426.14	-273.74	10429.72	1.48
PTB	21123	88.50	178.30	10790.18	-10477.10	-272.23	10480.62	0.00
232								
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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. **22221**

AUG 2013 RECEIVED ND OIL & GAS DIVISION

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

- [x] Notice of Intent — Approximate Start Date: **July 31, 2013**
- [ ] 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
- [x] Other **Waiver from tubing/packer requirement**

Well Name and Number					
Innoko 5301 41-12T					
Footages	Qtr-Qtr	Section	Township	Range	
250 F S L 2350 F E L	SWSE	12	153 N	101 W	
Field	Pool	County			
WILLOWCREEK Baker	THREE FORKS	MCKENZIE			

24-HOUR PRODUCTION RATE

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

Name of Contractor(s)			
Address	City	State	Zip Code

DETAILS OF WORK

Oasis Petroleum North America LLC requests a waiver from the tubing/pkr requirement included in NDAC 43-02-03-21: Casing, tubing, and cementing requirements during the completion period immediately following the upcoming fracture stimulation.
The following assurances apply:

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

Company		Telephone Number
Oasis Petroleum North America LLC		**281-404-9563**
Address: **1001 Fannin, Suite 1500**		
City: **Houston**	State: **TX**	Zip Code: **77002**
Signature: Heather McCowan	Printed Name: **Heather McCowan**	
Title: **Regulatory Assistant**	Date: **July 31, 2013**	
Email Address		

FOR STATE USE ONLY

- [ ] Received
- [x] Approved

Date: August 2, 2013
By: [signature]
Title: PETROLEUM ENGINEER

SUNDRY NOTICES AND REPORTS ON WELLS - FORM 4

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

JUL 2013 RECEIVED ND OIL & GAS DIVISION

Well File No. **222100-01**

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

☑ Notice of Intent	Approximate Start Date **October 1, 2013**	☐ Drilling Prognosis	☐ Spill Report
☐ Report of Work Done	Date Work Completed	☐ Redrilling or Repair	☐ Shooting
☐ Notice of Intent to Begin a Workover Project that may Qualify for a Tax Exemption Pursuant to NDCC Section 57-51.1-03.	Approximate Start Date	☐ Casing or Liner	☐ Acidizing
		☐ Plug Well	☐ Fracture Treatment
		☐ Supplemental History	☐ Change Production Method
		☐ Temporarily Abandon	☐ Reclamation
		☑ Other	**Central production facility-commingle prod**

Well Name and Number				
(see details)				
Footages F L F L	Qtr-Qtr	Section **12**	Township **153 N**	Range **101 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 North America LLC requests permission to add the following wells to CTB # 222100-01.
~~Well File #22740 Larry 5301 44-12B SESE 12-153-101 API 33-105-04981~~
Well File #22099 Yukon 5301 41-12T SWSW 12-153-101 API 33-053-03911
Well File #25571 Colville 5301 44-12T SESE 12-153-101 API 33-053-04981
Well File #22221 Innoko 5301 43-12T SWSE 12-153-101 API 33-053-03937
The following wells are currently being commingled in the subject CTB:
Well File #22100 Achilles 5301 41-12B SWSW 12-153-101 API 33-053-03912
Well File #22220 Jefferies 5301 43-12B SWSE 12-153-101 API 33-053-03936
Well File #20864 Bray 5301 43-12H SWSE 12-153-101 API 33-053-03609
Well File #22740 Larry 5301 44-12B SESE 12-153-101 API 33-053-04071

Please find the following attachments:1. A schematic drawing of the facility which diagrms the testing, treating, routing, and transferring of production. 2. A plat showing the location of the central facility 3. Affidavit of title indicating common ownership.

Company **Oasis Petroleum North America LLC**		Telephone Number **281-404-9491**
Address **1001 Fannin, Suite 1500**		
City **Houston**	State **TX**	Zip Code **77002**
Signature Brandi Terry	Printed Name **Brandi Terry**	
Title **Regulatory Specialist**	Date **July 24, 2013**	
Email Address **bterry@oasispetroleum.com**		

FOR STATE USE ONLY

☐ Received	☑ Approved
Date 7-30-13	
By ORIGINAL SIGNED BY DARYL GRONFUR	
Title METER SPECIALIST	

SUNDRY NOTICES AND REPORTS ON WELLS - FORM 4

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

Well File No. **22221**

RECEIVED JUL 2013 ND OIL & GAS DIVISION

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

- [x] Notice of Intent — Approximate Start Date: **July 15, 2013**
- [ ] 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
- [x] Reclamation
- [x] Other: **Intent to reclaim reserve pit**

Well Name and Number					
Innoko 5301 41-12T					
Footages	Qtr-Qtr	Section	Township	Range	
250 F S L 2350 F E L	**SWSE**	**12**	**153 N**	**101 W**	
Field	Pool	County			
Willow Creek	**Bakken**	**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	City	State	Zip Code
204 S. Ellery Avenue P.O. Box 461	**Fairview**	**MT**	**59221**

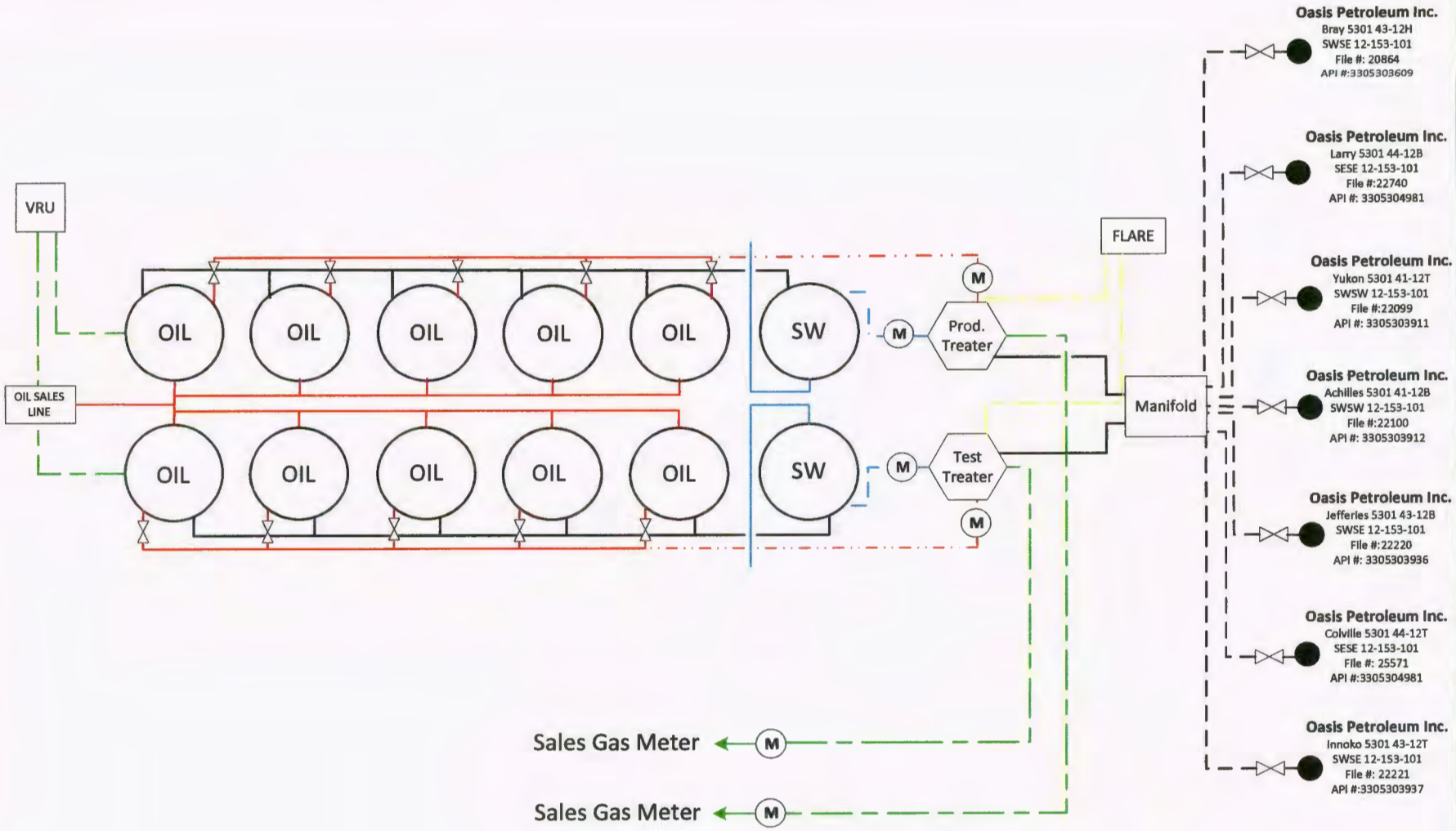
DETAILS OF WORK

Oasis Petroleum North America LLC plans to reclaim the reserve pit for the above referenced wells as follows:
The NDIC field inspector, Rick Dunn and the surface owners, were notified on 07/11/2013.
Surface owners: Larry Heen 14075 41st. Street NW Alexander, ND 58831
Spread material out in pit, cut top edge of liner and fold cuttings, cover entire pit with liner, backfill with clay slope and contour wellsite to ensure proper drainage.

Company		Telephone Number
Oasis Petroleum North America LLC		**281-404-9591**
Address		
1001 Fannin, Suite 1500		
City	State	Zip Code
Houston	**TX**	**77002**
Signature: Chcovington	Printed Name: **Chelsea Covington**	
Title: **Regulatory Assistant**	Date: **July 11, 2013**	
Email Address: **Ccovington@oasispetroleum.com**		

FOR STATE USE ONLY

[ ] Received	[x] Approved
Date	7-15-13
By	Ted Vandeel
Title	



OASIS PETROLEUM

5301 13-24 ACHILLES CENTRAL TANK BATTERY

DATE	REV.	BY	APPR.	SCALE
JULY 23, 2013	0	LEE		NA
LOCATION NORTH DAKOTA	FIELD BAKER			

COMMINGLING AFFIDAVIT

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

Tom F. Hawkins, being duly sworn, states as follows:

1. I am the Vice President - Land and Contracts employed by Oasis Petroleum North America LLC with responsibilities in the State of North Dakota and I have personal knowledge of the matters set forth in this affidavit.

2. Sections 13 and 24, Township 153 North, Range 101 West, 5th P.M., McKenzie County, North Dakota constitute a spacing unit in accordance with the applicable orders of the North Dakota Industrial Commission for the Bakken pool.

3. Four wells have been drilled in the spacing unit, which are the Bray 5301 43-12H, Achilles 5301 41-12B, Jefferies 5301 43-12B, Larry 5301 44-12B; and three wells have been permitted in the spacing unit, which are the Colville 5301 44-12T, Innoko 5301 43-12T and Yukon 5301 41-12T.

4. By Declaration of Pooled Unit dated August 26, 2011, filed in McKenzie County, North Dakota, document number 422312, all oil and gas interests within the aforementioned spacing unit were pooled.

5. All Working Interests, Royalty Interests and Overriding Royalty Interests in the Bray 5301 43-12H, Achilles 5301 41-12B, Jefferies 5301 43-12B, Colville 5301 44-12T, Innoko 5301 43-12T and Yukon 5301 41-12 wells are common.

Dated this 9TH day of July, 2013.

Tom F Hawkins TD

Tom F. Hawkins
Vice President-Land and Contracts

STATE OF TEXAS)
) ss.
COUNTY OF HARRIS)

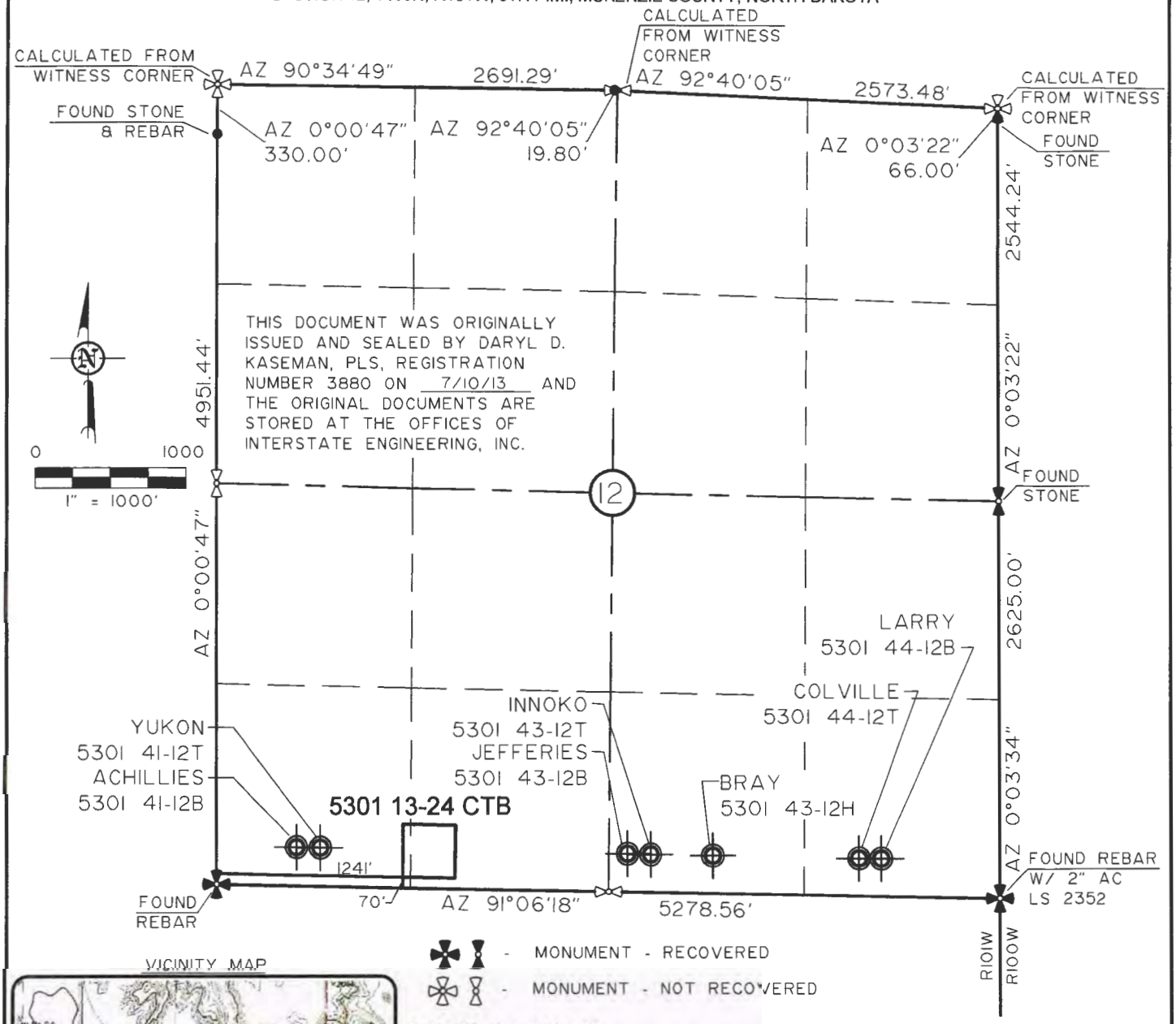
Subscribed to and sworn before me this 9TH day of July, 2013.

Notary Public
State of Texas
My Commission Expires: August 14, 2017

JENNIFER ELLEN SWENSON
My Commission Expires
August 14, 2017

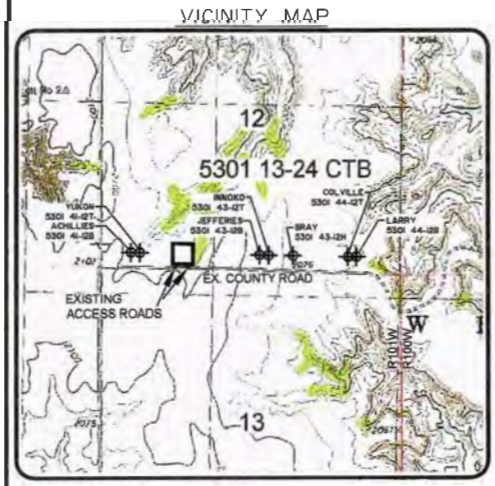
BATTERY LOCATION PLAT

OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 202 HOUSTON, TX 77002
"5301 13-24 CTB"
SECTION 12, T153N, R101W, 5TH P.M., MCKENZIE COUNTY, NORTH DAKOTA



- MONUMENT - RECOVERED
- MONUMENT - NOT RECOVERED

VICINITY MAP



STAKED ON 3/08/12
VERTICAL CONTROL DATUM WAS BASED UPON CONTROL POINT 13 WITH AN ELEVATION OF 2090.8'

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

DARYL D. KASEMAN LS-3880

REGISTERED LAND SURVEYOR
DARYL D. KASEMAN
LS-3880
DATE: 7/10/13
NORTH DAKOTA

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1/5
SHEET NO.

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Interstate Engineering, Inc.
P.O. Box 648
425 East Main Street
Sidney, Montana 59270
Ph (406) 433-5617
Fax (406) 433-5618
www.iengi.com
Other offices in Minnesota, North Dakota and South Dakota

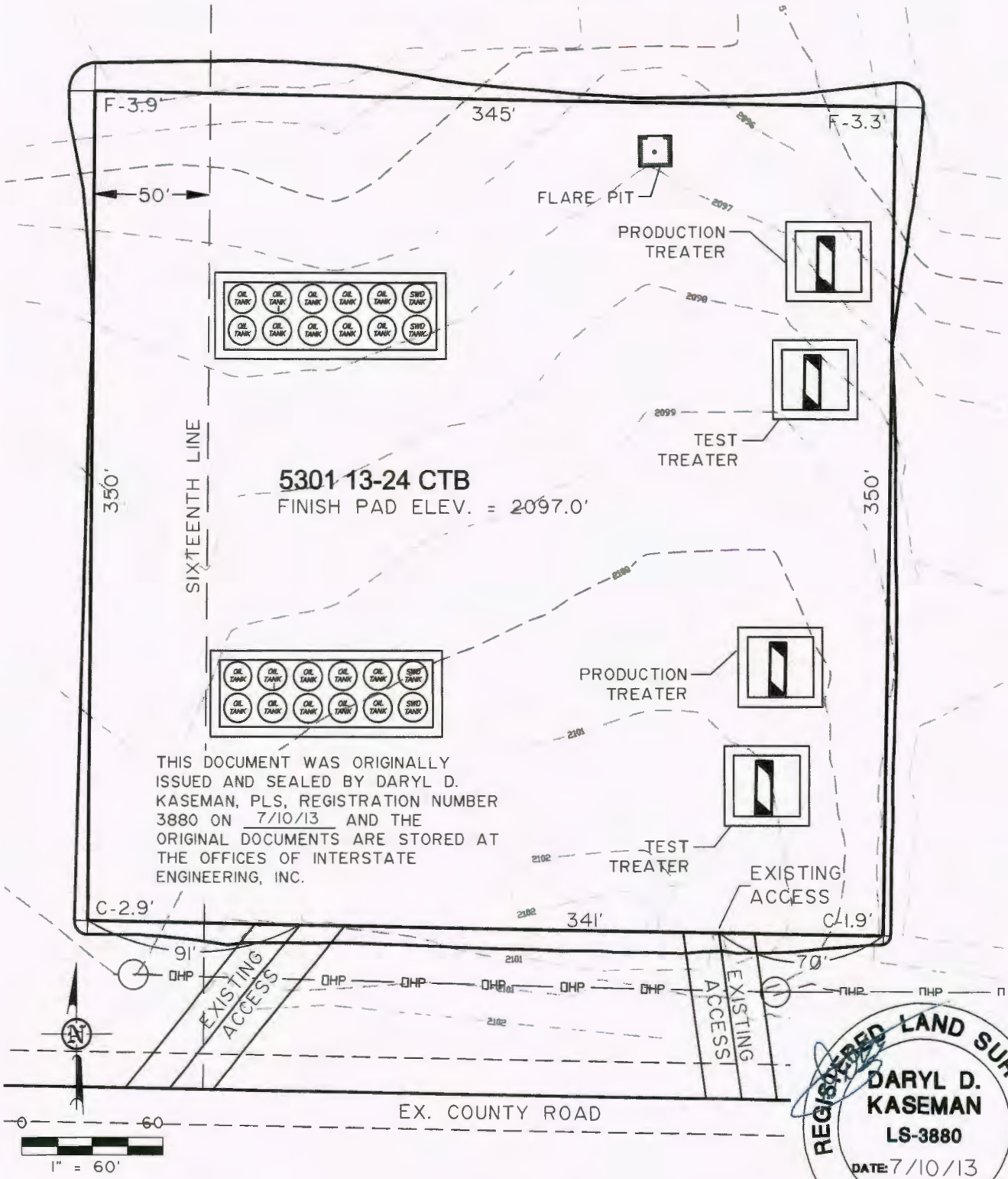
OASIS PETROLEUM NORTH AMERICA, LLC
WELL LOCATION PLAT
SECTION 12, T153N, R101W
MCKENZIE COUNTY, NORTH DAKOTA

Drawn By: J.D.M.	Project No.: S12-09-249		
Checked By: D.D.K.	Date: SEPT. 2012		

Revision No.	Date	By	Description
REV 1	7/10/13	JDM	ADDED WELLS

PAD LAYOUT

OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 202 HOUSTON, TX 77002
"5301 13-24 CTB"
SECTION 12, T153N, R101W, 5TH P.M., MCKENZIE COUNTY, NORTH DAKOTA



THIS DOCUMENT WAS ORIGINALLY ISSUED AND SEALED BY DARYL D. KASEMAN, PLS, REGISTRATION NUMBER 3880 ON 7/10/13 AND THE ORIGINAL DOCUMENTS ARE STORED AT THE OFFICES OF INTERSTATE ENGINEERING, INC.

REGISTERED LAND SURVEYOR
DARYL D. KASEMAN
LS-3880
DATE: 7/10/13
NORTH DAKOTA

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

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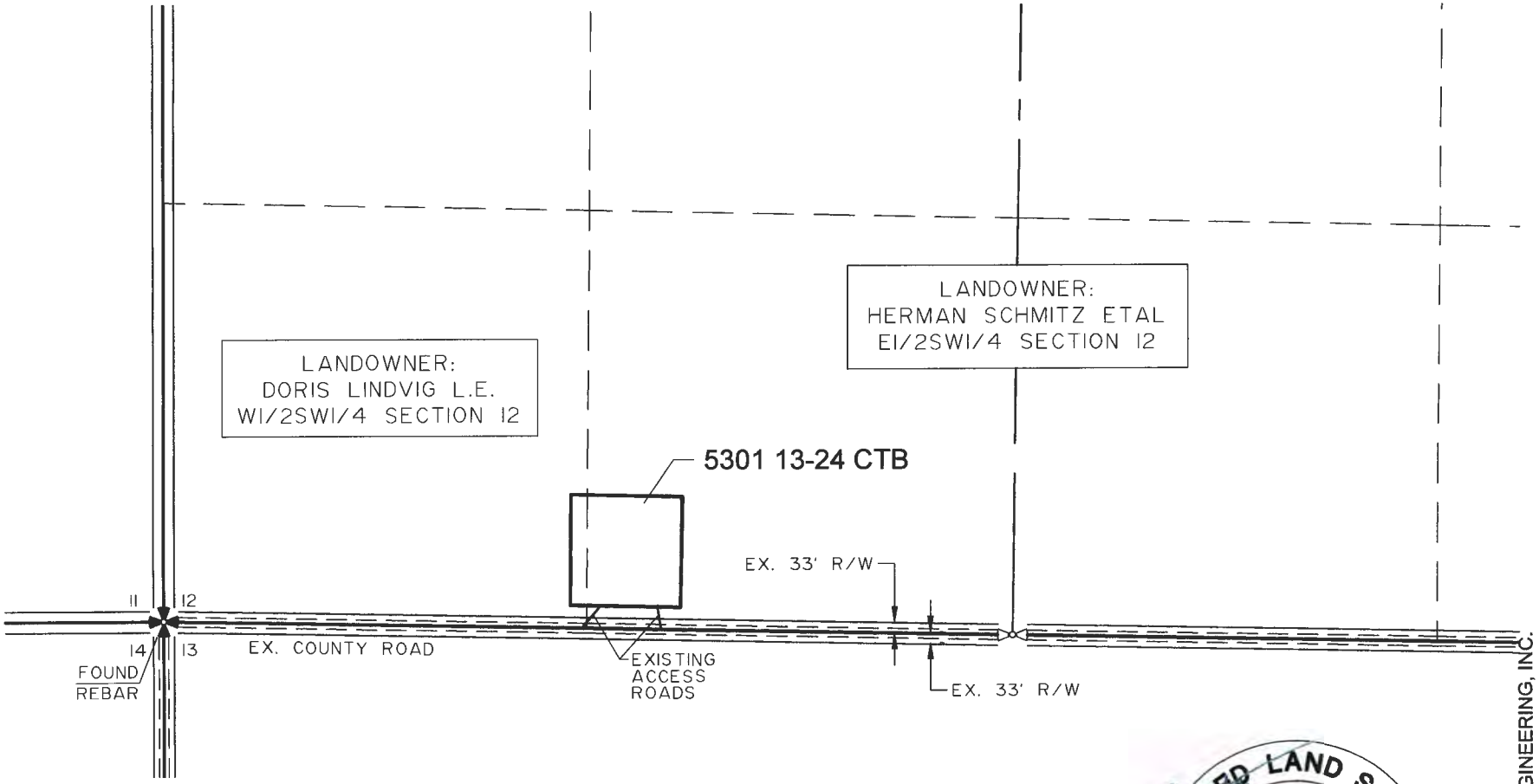
OASIS PETROLEUM NORTH AMERICA, LLC
PAD LAYOUT
SECTION 12, T153N, R101W
MCKENZIE COUNTY, NORTH DAKOTA

Drawn By: J.D.M. | Project No.: S12-9-249
Checked By: D.D.K. | Date: SEPT. 2012

Revision No.	Date	By	Description
REV 1	7/10/13	JDM	ADDED WELLS

ACCESS APPROACH

OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 202 HOUSTON, TX 77002
"5301 13-24 CTB"
SECTION 12, T153N, R101W, 5TH P.M., MCKENZIE COUNTY, NORTH DAKOTA



0 500
1" = 500'

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

REGISTERED LAND SURVEYOR
DARYL D. KASEMAN
LS-3880
DATE: 7/10/13
NORTH DAKOTA

Revision No.	Date	By	Description
REV 1	7/10/13	JDM	ADDED WELLS

OASIS PETROLEUM NORTH AMERICA, LLC
ACCESS APPROACH
SECTION 12, T153N, R101W
MCKENZIE COUNTY, NORTH DAKOTA

Drawn By: J.D.M. Project No.: S12-09-249
Checked By: D.D.K. Date: SEPT. 2012

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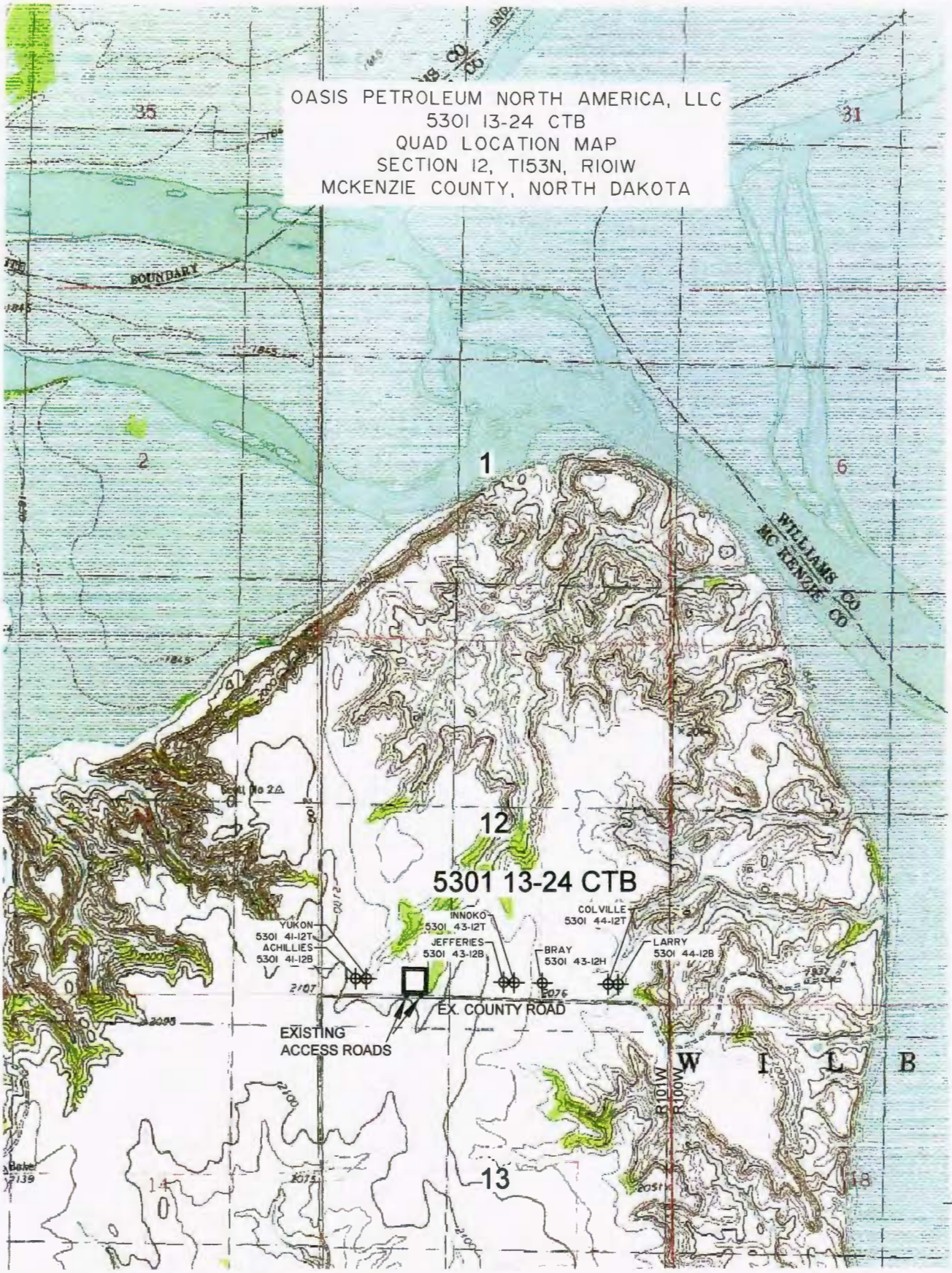

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Sidney, Montana 59270
Ph (406) 433-5617
Fax (406) 433-5618
www.iengi.com
Other offices in Minnesota, North Dakota and South Dakota

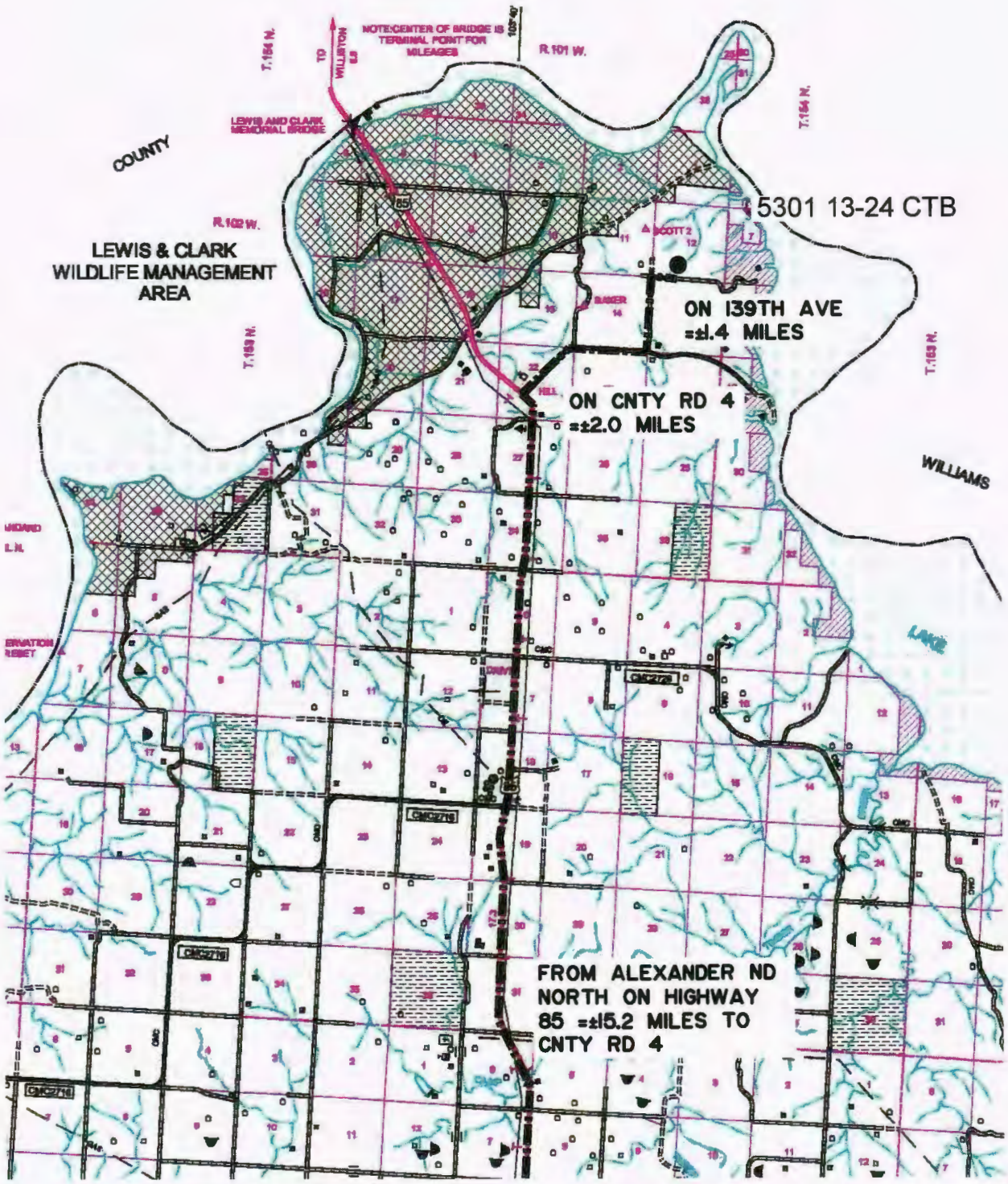
OASIS PETROLEUM NORTH AMERICA, LLC
QUAD LOCATION MAP
SECTION 12, T153N, R101W
MCKENZIE COUNTY, NORTH DAKOTA

Drawn By: J.D.M. | Project No.: S12-09-249
Checked By: D.D.K. | Date: SEPT. 2012

Revision No.	Date	By	Description
REV 1	7/10/13	JDM	ADDED WELLS

COUNTY ROAD MAP

OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 202 HOUSTON, TX 77002
"5301 13-24 CTB"
SECTION 12, T153N, R101W, 5TH P.M., MCKENZIE COUNTY, NORTH DAKOTA



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SCALE: 1" = 2 MILE

5/5
SHEET NO.

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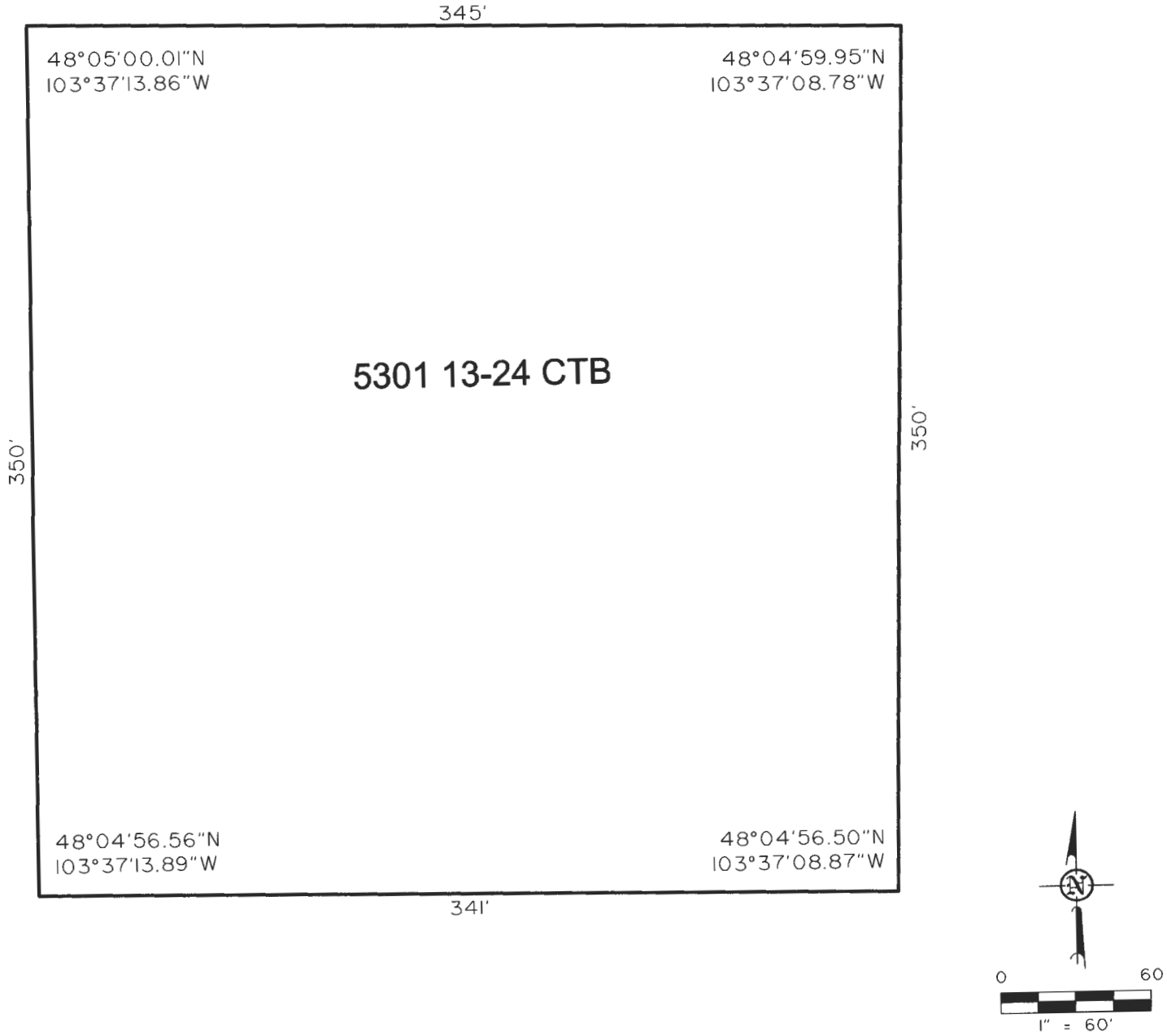
OASIS PETROLEUM NORTH AMERICA, LLC
COUNTY ROAD MAP
SECTION 12, T153N, R101W
MCKENZIE COUNTY, NORTH DAKOTA

Drawn By: J.D.M. | Project No.: S12-09-249
Checked By: D.D.K. | Date: SEPT. 2012

Revision No.	Date	By	Description
REV 1	7/10/13	JDM	ADDED WELLS

LAT/LONG PAD CORNERS



Oasis Petroleum North America, LLC

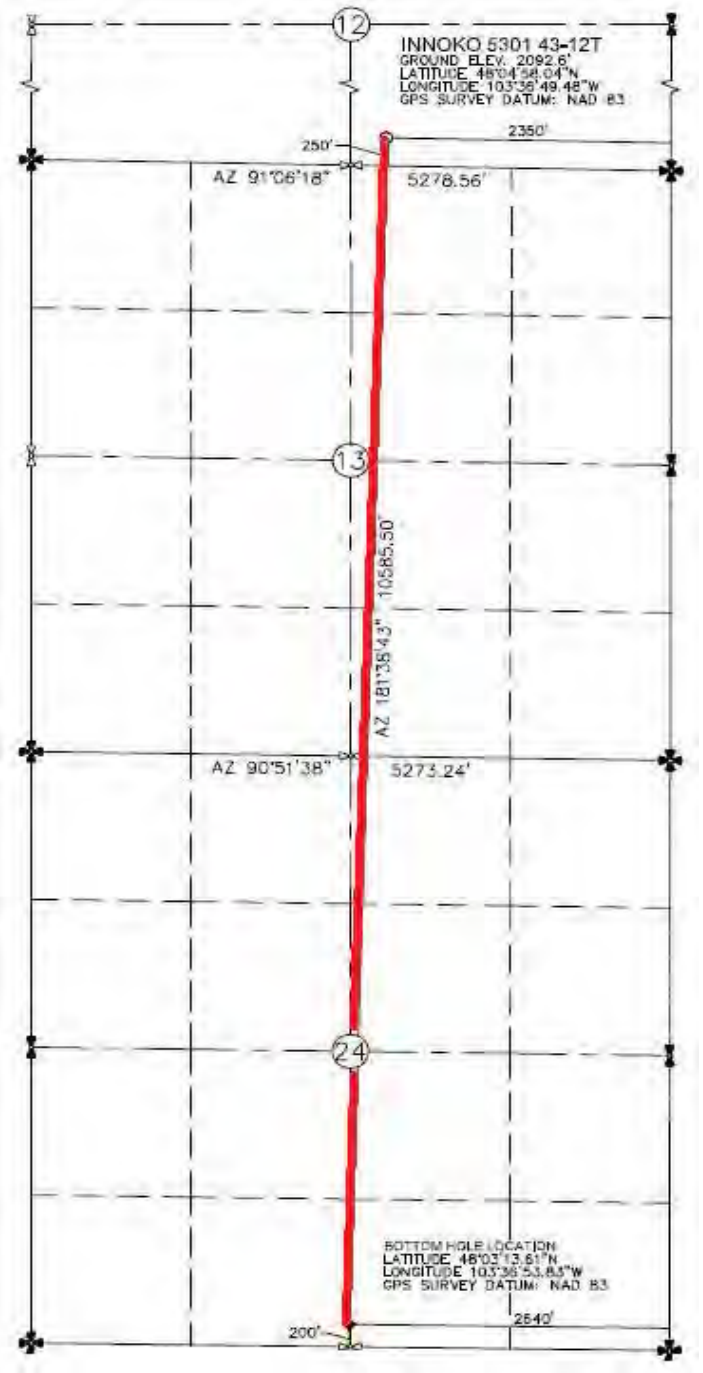
Innoko 5301 43-12T

250' FSL & 2,410' FEL

SW SE Section 12, T153N-R101W

Baker Field / Three Forks

McKenzie County, North Dakota



BOTTOM HOLE LOCATION:

10,476.07' south & 274.56' west of surface location or approx.

310.71' FSL & 2,596.09' FWL, SE SW Section 24, T153N-R101W

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

Prepared by:
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WELL EVALUATION

Innoko 5301 43-12T

Figure 1: Nabors B25 drilling the Oasis Petroleum North America Innoko 5301-43-12T during July 2013, south of Williston in Williams County, North Dakota. (Photos by Hannah Thatcher, wellsite geologist)

INTRODUCTION

The Oasis Petroleum North American, LLC. Innoko 5301 43-12T [SW SE Section 12, T153N, R101W] is located approximately 20 miles south of Williston, North Dakota. The well was spud on July 2, 2013 with Nabors drilling rig B25, and represents Oasis Petroleum's continuing development of the Three Forks Formation within Baker Field **(Figure 1)**. The well was planned to drill an approximately 9,288' long lateral, along a proposed azimuth of 181.25°. The well-bore will be enhanced for production by multi-stage fracture stimulation.

OFFSET CONTROL INFORMATION

Three wells were used to develop a well-rounded prognosis of offset tops prior to drilling the Innoko 5301 43-12T. The Gulf Oil-Lindvig 1-11-3C [NW NE Sec. 11, T152N, R101W] is located approximately 0.71 miles northwest, the Oasis-Petroleum Bray 5301 43-12H is located 0.90 miles east [SW SE Sec. 12, T153N, R101W], and the most recent offset control well, the Oasis-Yukon 5301 41-12T [SW SW Sec. 12, T153N, R101W], is located approximately 0.4 miles southeast of the subject well **(Figure 2)**.

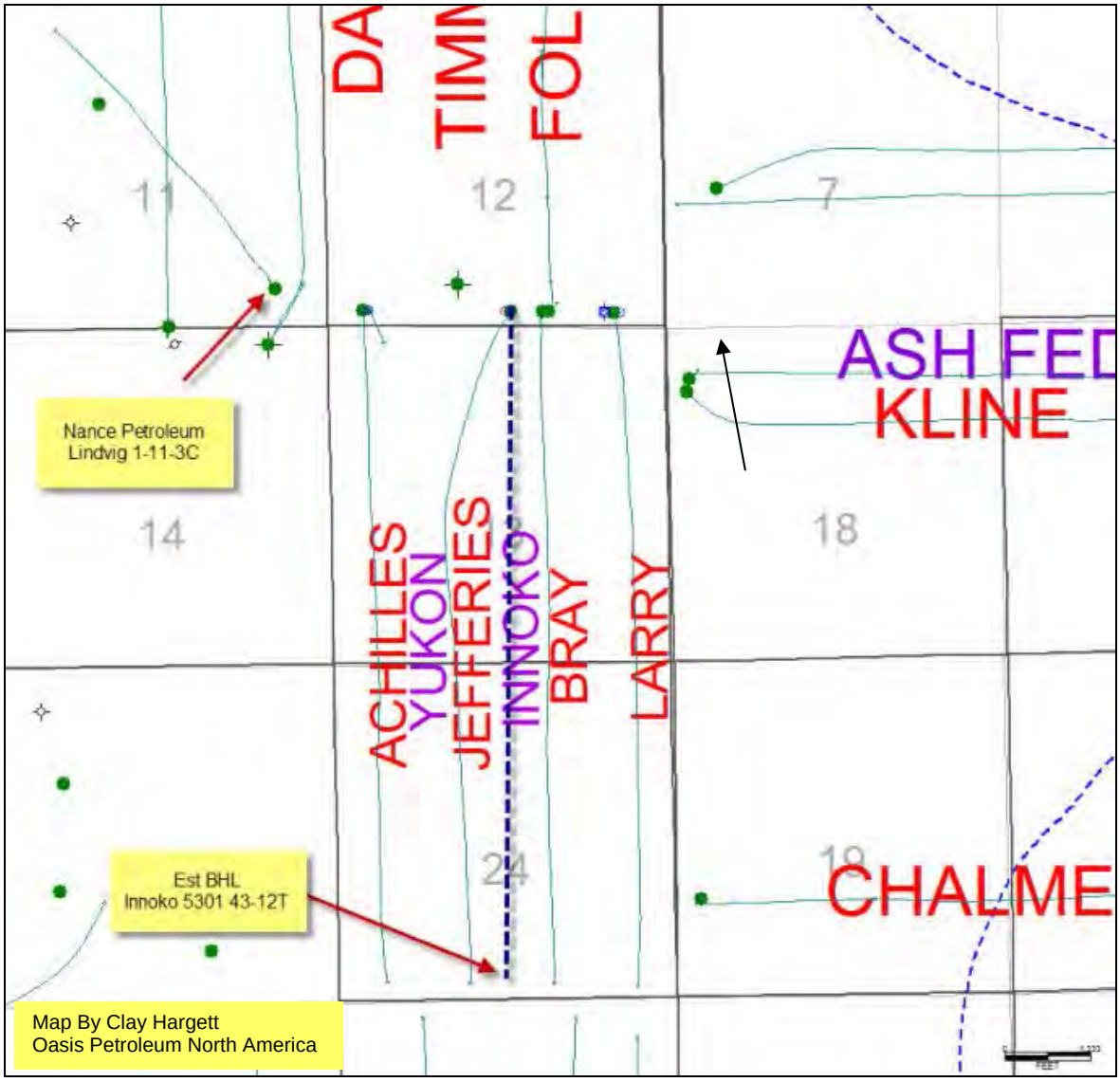

Figure 2: Offsetting control wells in relation to the Innoko 5301 43-12T well.

Kick-off point for the curve was established from the isopach of the "base last salt" marker to the Three Forks "target" in the offset wells. The Lindvig 1-11-3C was used as the primary offset through the vertical and curve sections. The curve was successfully landed within the Three Forks Formation at 10,839' TVD.

ENGINEERING

Vertical & Curve Operations:

On July 2, 2013 the Innoko 5301 43-12T was spud by Nabors drilling rig B25. A 13½" hole was drilled with freshwater to 2,111' where the well-bore was isolated with 9 ⅝" casing and cemented to surface. From this depth, an 8 ¾" Smith MDSI616 bit was used to drill out of casing, using diesel invert drilling fluid. Invert fluid was used throughout the remaining vertical and curve sections, maintaining a mud weight of 9.6-10.3 (ppg) for stable-hole conditions. The vertical hole was drilled to a kick-off point (KOP) of 10,300' MD where the curve-build was initiated.

While drilling the curve, gamma-ray signatures were compared to those of the three offsets. Target projections from the False Bakken marker provided a reliable landing target **(Figure 3)**. On the night of July 11, 2013 the curve was landed at a depth of 11,121' MD (10,839' TVD), placing the well-bore approximately 16' below the top of the target zone. Directional tools were then pulled out of the hole and a string of 7" casing was set (11,121' MD) and then cemented by Schlumberger after which true lateral operations commenced.

LANDING PROJECTION				
Formation/ Zone:	Proposed Top of Target From:			
	Lindvig 1-11-3C	Yukon 5301 41-12T	Bray 5301 43-12H	Average of Offset Wells
Kibbey Lime	10,827'	10,828'	10,832'	10,829'
Charles	10,825'	10,831'	10,838'	10,831'
UB	10,823'	-	10,836'	10,830'
Base Last Salt	10,816'	10,817'	10,825'	10,819'
Ratcliffe	10,822'	-	10,845'	10,834'
Mission Canyon	10,827'	10,819'	10,839'	10,828'
Lodgepole	10,819'	10,814'	10,831'	10,821'
Lodgepole A	-	-	-	-
Lodgepole B	10,819'	-	-	10,819'
Lodgepole C	10,824'	10,644'	10,830'	10,766'
Lodgepole D	10,815'	10,692'	10,828'	10,778'
Lodgepole E	10,815'	-	10,829'	10,822'
Lodgepole F	10,813'	10,778'	-	10,796'
False Bakken	10,815'	10,824'	10,823'	10,821'
Upper Bakken Shale	10,816'	10,821'	10,821'	10,819'
Middle Bakken	10,821'	10,822'	10,821'	10,821'
Low er Bakken	10,823'	10,822'	10,823'	10,823'

Figure 3: Table constructed to calculate distance from markers to target landing depth.

Lateral Operations:

Leam provided equipment and personnel for MWD and directional drilling services. The directional drillers and Sunburst geologists worked closely together throughout the project to make steering decisions to maximize the amount of borehole exposure to pay zone for the lateral section. At 11,121' MD, a 6" bit, 1.50º mud motor and MWD tools comprised the first lateral bottom-hole assembly (BHA). At 17,310' MD the BHA was replaced due to problems during sliding. The BHA was replaced and drilled efficiently to a total depth of 21,122' MD, at a final closure distance of 10,479.67' with a closure direction of 181.5°. The bottom-hole location is: 10,476.07' south and 274.56 west of surface location or 310.71' FSL & 2,596.09' FWL, SE SW Section 24, T153N, R101W **(Figure 4)**.

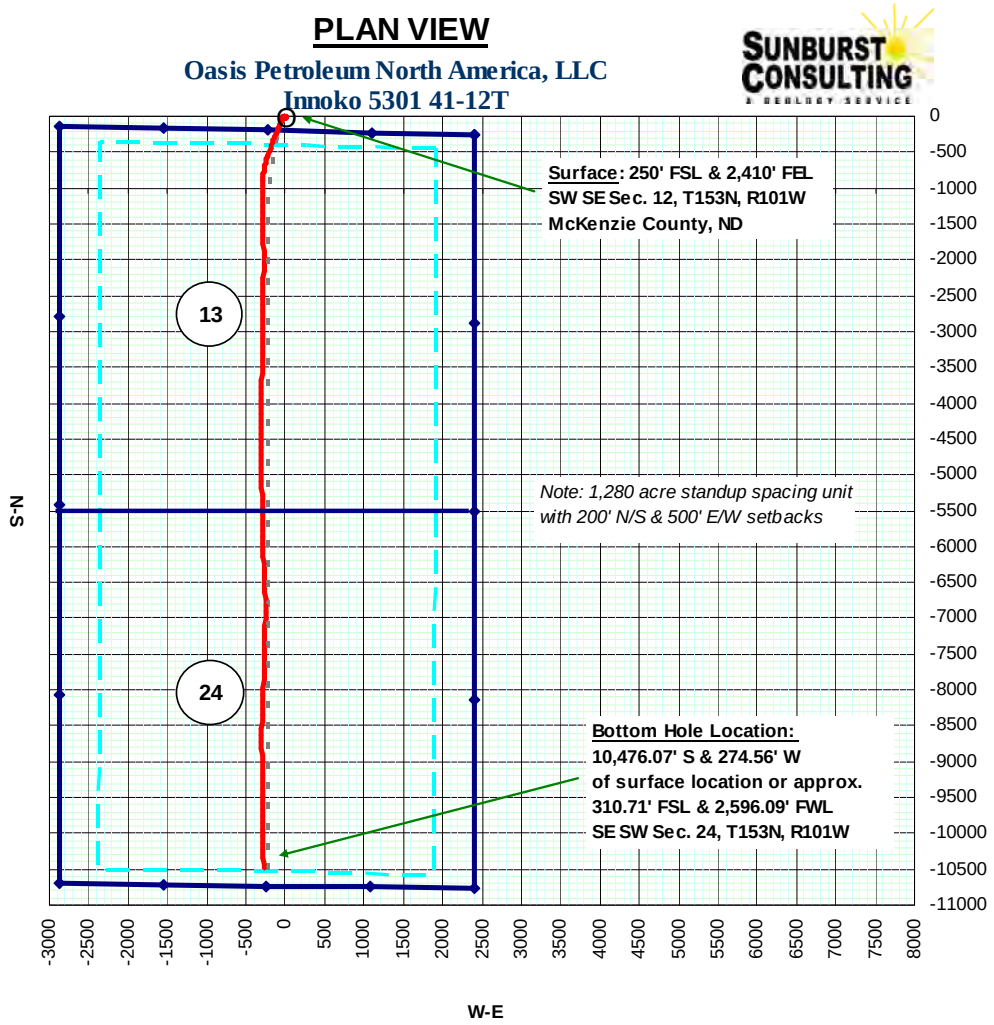

Figure 4. Plan view of the Innoko 5301 43-12T well's spacing unit and well path as drilled.

GEOLOGIC EVALUATION

Methods:

Geologic supervision for the Innoko 5301 43-12T was provided by Sunburst Consulting, Inc. with two well-site geologists. A digital gas detector and chromatograph were interfaced with a Pason electronic data recorder system (EDR). The EDR provided drill rate, on-off bottom and pump strokes to the gas detection computer and received total gas information from Sunburst for viewing around location. Lagged samples were caught by the rig crew in 30' intervals from 8,300' MD to 10,850' MD, 10' intervals from 10,850' MD to 11,080' MD, and 30' intervals from 11,080' MD to 21,122'. Wet and dry cuttings were examined under a binocular microscope. Complete lithologic descriptions & sampling intervals are provided in the lithology document within this evaluation. Two sets of dry cuttings were collected during the duration of the well. One set was sent to Oasis Petroleum North American, LLC, and the other to the State of North Dakota. Evidence of light hydrocarbons present in the drilling fluid was reported by the gas chromatography equipment and documented on the mud log presented with this report.

Generalized Stratigraphy and Zones of Interest:

The **Kibbey Formation** (Mississippian; Big Snowy Group) is a regressive sequence that consists of a dark orange to red-brown siltstone with trace amounts of off white to light gray anhydrite. Upper parts of the formation can contain porosity which can sometimes be as high as 20 percent. The **Kibbey "Lime"** marker was encountered at 8,390' (-6,272'), and consists of a gray to gray-brown argillaceous lime mudstone with no visible porosity.

The **Charles Formation** (Mississippian; Madison Group) represents a highly variable depositional environment, characterized by numerous and abrupt changes from restricted hypersaline to open shallow water carbonate deposition. The Charles is an evaporite dominated sequence characterized by interbedded halite, anhydrite, and intermittent beds of light to medium gray slightly argillaceous limestone. Salts are represented by drastic increases in the rate of penetration (ROP), anhydrite is characterized by sudden decrease in ROP. The **1st Charles Salt** was penetrated at 8,535' TVD (-6,417'). Other salt beds were encountered intermittently for the next 690 feet. The **Base of the Last Salt (BLS)** marker bed was drilled at 9,226' TVD (-7,207'). Below the BLS the Charles is characterized as a light gray argillaceous limestone and dolo-mudstone, and represents the return to shallow water, carbonate depositional environment which persisted for the next 50 feet. The **Ratcliffe** interval was logged at 9,278' TVD (-7,160') and is described as a light gray dolomite with interbedded anhydrite layers, followed by interbedded dolomitic and argillaceous limestone. The lack of porosity and absence of hydrocarbons indicates this interval has little prospect for future development.

The **Mission Canyon Formation** (Mississippian; Madison Group) was drilled at 9,458' TVD (-7,340') and is comprised largely of light gray lime mudstone, followed by gray to tan earthy textured argillaceous lime mudstone. Shows within the Mission Canyon ranged from 50 to 152 units against a 10.1 (ppg) mud weight.

The top of the **Lodgepole Formation** was logged at 10,012' TVD (-7,894'). In general, the Lodgepole can be described as a medium to dark gray-brown, argillaceous lime mudstone with crystalline texture and trace amounts of disseminated pyrite **(Figure 5)**. The **False Bakken** (Carrington Shale), drilled at 10,718' TVD (-8,600'), is comprised of very dark brown to black, slightly pyritic & calcareous shale **(Figure 6)**. Strong hydrocarbon shows in the lower 100' of the Lodgepole were as high as 80 total gas units, and suggests that some of the oil and gas from the Bakken Formation may be exploiting fractures within the lower Lodgepole.

Figure 5 & 6: Wet cutting of the Lodgepole Formation (left) and False Bakken sub-interval (right) at 10X.

The **Bakken Formation** (Devonian – Mississippian) has four formal members, an upper and lower black, fissile, organic-rich pyritic shale, separated by a clastic middle and lower member. The **Upper Bakken Shale** was drilled at 10,727' TVD (-8,609') with sample returns typically described as black, carbonaceous, petroliferous shale with trace amounts of disseminated pyrite **(Figure 7)**. The **Middle Bakken**, penetrated at 10,743' TVD (-8,625'), consists of a varying thickness and sequence of interbedded siltstone, limestone and silty sandstone. Common *spotty light brown oil staining* was present along with gas shows as high as 611 units. Penetrated at 10,786' TVD (-8,668'), the **Lower Bakken Shale** was described as a black to dark brown carbonaceous shale with trace amounts of disseminated pyrite **(Figure 8)**. Gas shows encountered in the lower shale member read as high as 591 units (C1-C4). The **Pronghorn** was penetrated at 10,798' TVD (-8,680') and is commonly described as a dark to medium gray, calcite cemented siltstone.

Figure 7 & 8: Wet cuttings of the Upper Bakken Shale (left), Lower Bakken Shale (right) at 10X.

The **Three Forks Formation** (Devonian; Kaskaskia Sequence), which represents a regressive sequence deposited in a supratidal sabkha environment, was drilled at 10,811' TVD (-8,693') and is comprised of a light to medium gray, cream to off white sucrosic dolomite with trace to occasional amounts of disseminated pyrite **(Figure 10)**. The dolomite is also silty and sandy in parts, and contains possible intercrystalline porosity with *spotty light brown oil staining*. Another component of the Three Forks is a light gray-brown to gray-green claystone overlain by an orange to pink and green dolomite. Shows within the Three Forks Formation ranged from 93 to 911 units in a drilling mud weighing 9.7 (ppg).

Figure 10: Wet cuttings of the Three Forks dolomite at 10X.

Geo-steering:

Samples from the target zone varied in porosity, oil staining, color, cementation, and pyrite content. Stratigraphic location in the target zone was based on these sample observations along with gas shows, drill rates and gamma-ray values. Severe doglegs were to be avoided to obtain the desired vertical section and aid in a successful completion liner run.

The Oasis Petroleum North America, LLC prospect geologist defined the target as a 15' zone that began 12' below the top of the Three Forks and ended four feet above the claystone marker, 29' below the top of the Three Forks. The target zone consisted of an upper dolomite interval reading 75-50 (API) gamma counts (A marker). The center of the target interval was comprised of an argillaceous dolomite reading 65-30 (API) gamma counts (B marker). Underlying the argillaceous dolomite, in the center of the zone, was another dolomite layer with gamma readings of 90-70 (API) counts (C marker). The A-C gamma markers were used for determining depth within the target interval **(Figure 11)**.

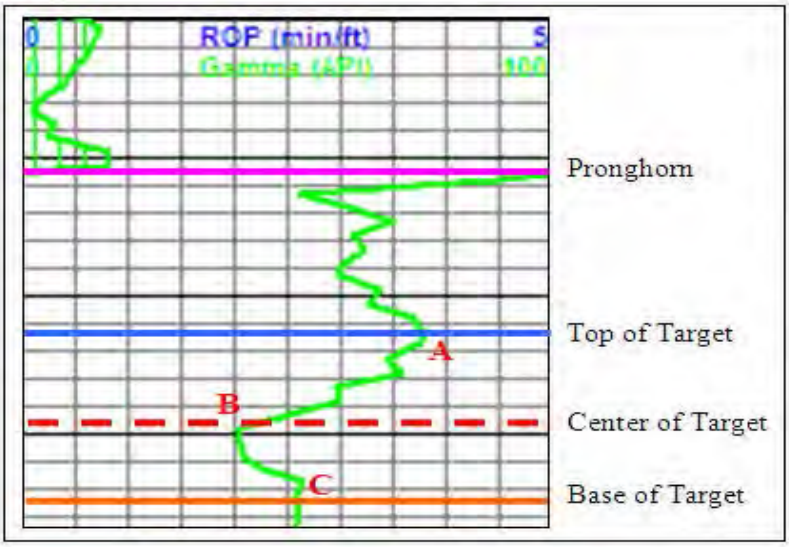

Figure 11: Offset gamma ray profile of the upper Three Forks (0-100 api. scale)

Horizontal drilling began 24' below the Three Forks top. Just out of casing the well-bore drilled just above the claystone, below the base of target ("C" marker). At 11,196' MD the bore was successfully turned up, and made its way back in to the target zone at 11,352' MD. The well bore continued to rise up to the center of the target, near the "B" marker. The well bore stayed directly above the center of the target for the next 400' where it began to fall down toward the base of target ("C" marker). Once again the well bore was turned back up to the center of target where it stayed for the next 700'. At 13,180' MD the well rose toward the top of target ("A" marker), where it drilled until 14,602' MD. Downward oriented slides soon, accompanied with a dip reversal, led to drilling out the bottom of the zone ("C" marker) at 14,700' MD. The well re-entered the target zone, at 15,485' MD, and began to rise up toward the center of the zone ("B" marker) where it drilled for the next 2,870'. The well then drilled towards the base of target ("C" marker) at 16,115' MD, and after 400' re-entered the target ("B" marker) and stayed until total depth was called at 21,122' MD.

Using the aforementioned information gathered during drilling, offset log information and the structural data provided from Oasis Petroleum North America, LLC, well-site geologists were able to anticipate, and interpret the local apparent dip during the drilling of the Innoko 5301 43-12T well. A total depth of 21,122' MD was reached on July 20, 2013 at 23:30 CT. The target resultant was 100% within the Three Forks Formation. The resulting structure of the Three Forks Formation was a rise in TVD of 47.10' over 10,020', resulting in an overall up-dip of 0.27º as portrayed on the Innoko 5301 43-12T profile **(Figure 12)**.

Hydrocarbons:

Gas monitoring and fluid gains were monitored to evaluate the viability of this reservoir during the Innoko 5301 43-12T well. In the invert mud system, hydrostatic conditions were maintained near balance. This allowed for gas and fluid gains from the well to be monitored. The unit of measure for gas on this well was units (u), which was defined as 100 units equaling 1% methane equivalent in air.

Background gas observed during the lateral ranged from 20 to 600 units. Invert drilling fluid was used throughout the drilling of the vertical and curve weighed 9.6-10.3 (ppg) and saline drilling fluid was used during the lateral with a mud weight of 9.2-9.7 (ppg). Gas shows ranged up to 911 units, and connection gases were observed up to 2,059 units. Gas components (C1-C4) were observed throughout the course of the lateral. Trip gases were observed as high as 1,150 units **(Figure 12)**.

Oil shows were very light throughout the lateral ranging from 0-3% in sample. It was observed as *a light brown spotty oil stain* that yielded a slow to moderate streaming to diffuse light green cut fluorescence.

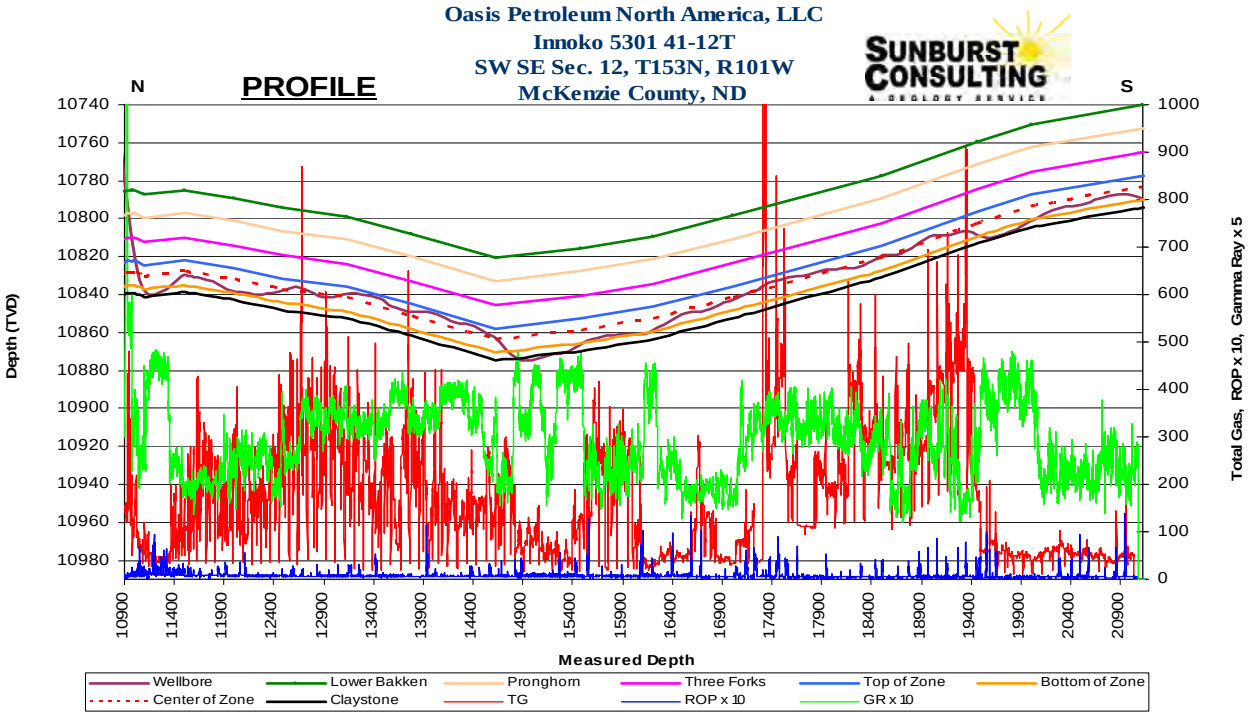

Figure 12: Well profile representing estimated dip value & gamma ray for the Innoko 5301 43-12T lateral.

SUMMARY

The Nabors B25 drilling rig successfully drilled a two-section, horizontal well-bore within the Three Forks Formation at the Innoko 5301 43-12T. A net of 10,125' was drilled within the Three Forks. A mud program consisting of diesel invert (9.6–10.3 ppg) was used during the vertical and curve build sections, and a saline based mud (9.2-9.7 ppg) was used during the lateral which maintained stable-hole conditions and permitted adequate analysis of gas concentrations.

Projections of dip were successfully used to maintain the well-bore in the Three Forks Formation for 100% of the lateral. Samples from the target consisted of light to medium gray, cream to off white, sucrosic dolomite. Intercrystalline porosity was generally seen throughout the target zone during the entire lateral. Samples from the ideal zone contained a *spotty light brown oil stain*. Hydrocarbon shows in the target zone were moderate throughout the lateral and stronger within the targeted interval.

The Innoko 5301 43-12T will be fitted with a 4 ½" production liner and swell packers in preparation for a fracture stimulation that will determine the true commercial value of the well. The well currently awaits fracture stimulation.

Respectfully submitted,

Hannah Thatcher
C/o Sunburst Consulting, Inc.
July 21, 2013

WELL DATA SUMMARY

OPERATOR:	**Oasis Petroleum North America, LLC**
ADDRESS:	1001 Fannin, Suite 1500 Houston, TX 77002
WELL NAME:	**Innoko 5301 43-12T**
API #:	33-053-03937-00-00
WELL FILE #:	22221
SURFACE LOCATION:	250' FSL & 2,410' FEL SW SE Section 12, T153N-R101W
FIELD/ PROSPECT:	Baker Field / Three Forks
COUNTY, STATE	McKenzie County, North Dakota
BASIN:	Williston
WELL TYPE:	Three Forks Horizontal
ELEVATION:	GL: 2,093' KB: 2,118'
SPUD/ RE-ENTRY DATE:	July 2, 2013
BOTTOM HOLE LOCATION:	10,476.07' south & 274.56' west of surface location or approx. 310.71' FSL & 2,596.09' FWL, SE SW Section 24, T153N-R101W
CLOSURE COORDINATES:	Closure Azimuth: 181.50° Closure Distance: 10,479.67'
TOTAL DEPTH / DATE:	21,122' on July 20, 2013 100% within Three Forks
TOTAL DRILLING DAYS:	19 days
CONTRACTOR:	Nabors B25

PUMPS:	H &H Triplex (stroke length - 12")
TOOLPUSHERS:	Casey Pippenger, Bruce Walter
FIELD SUPERVISORS:	Bruce Jorgenson, Bob Brown
CHEMICAL COMPANY:	Fluid Control
MUD ENGINEER:	Keith McCarty, Warren Carlson
MUD TYPE:	Fresh water in surface hole Diesel invert in curve; Salt water in lateral
MUD LOSSES:	Invert Mud: 506 bbls., Salt Water: 148 bbls.
PROSPECT GEOLOGIST:	Clay Hargett
WELLSITE GEOLOGISTS:	Hannah Thatcher, Daniel Haynes
GEOSTEERING SYSTEM:	Sunburst Digital Wellsite Geological System
ROCK SAMPLING:	30' from 8,300' - 10,850' 10' from 10,850' -11,080' 30' from 11,080' - 21,122' (TD)
SAMPLE EXAMINATION:	Trinocular microscope
SAMPLE CUTS:	Trichloroethylene
GAS DETECTION:	MSI (Mudlogging Systems, Inc.) TGC - total gas with chromatograph Serial Number(s): ML-440
DIRECTIONAL DRILLERS:	LEAM Drilling Systems / Oasis Clint Carnes, Bob Brown, Bruce Jorgenson, Mark Lawler
MWD:	LEAM Drilling Systems Tim Dufor, Eliot Fogel
CASING:	Surface: 9 5/8" 36# J-55 set to 2,111' Intermediate: 7" 32# HCL-80 set to 11,121'

KEY OFFSET WELLS:

Gulf Oil
Lindvig 1-11-3C
NW NW Sec. 11, T152N, R101W
McKenzie Co., ND

Oasis Petroleum North America, LLC
Yukon 5301 41-12T
SWSW Sec. 12, T153N, R101W
McKenzie Co., ND

Oasis Petroleum North America, LLC
Bray 5301 43-12H
SW SE Sec. 12, T153N, R101W
McKenzie Co., ND

WELL LOCATION PLAT

OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 1500, HOUSTON, TX 77002
"INNOKO 5301 43-12T"
250 FEET FROM SOUTH LINE AND 2350 FEET FROM EAST LINE
SECTION 12, T153N, R101W, 5TH P.M., MCKENZIE COUNTY, NORTH DAKOTA

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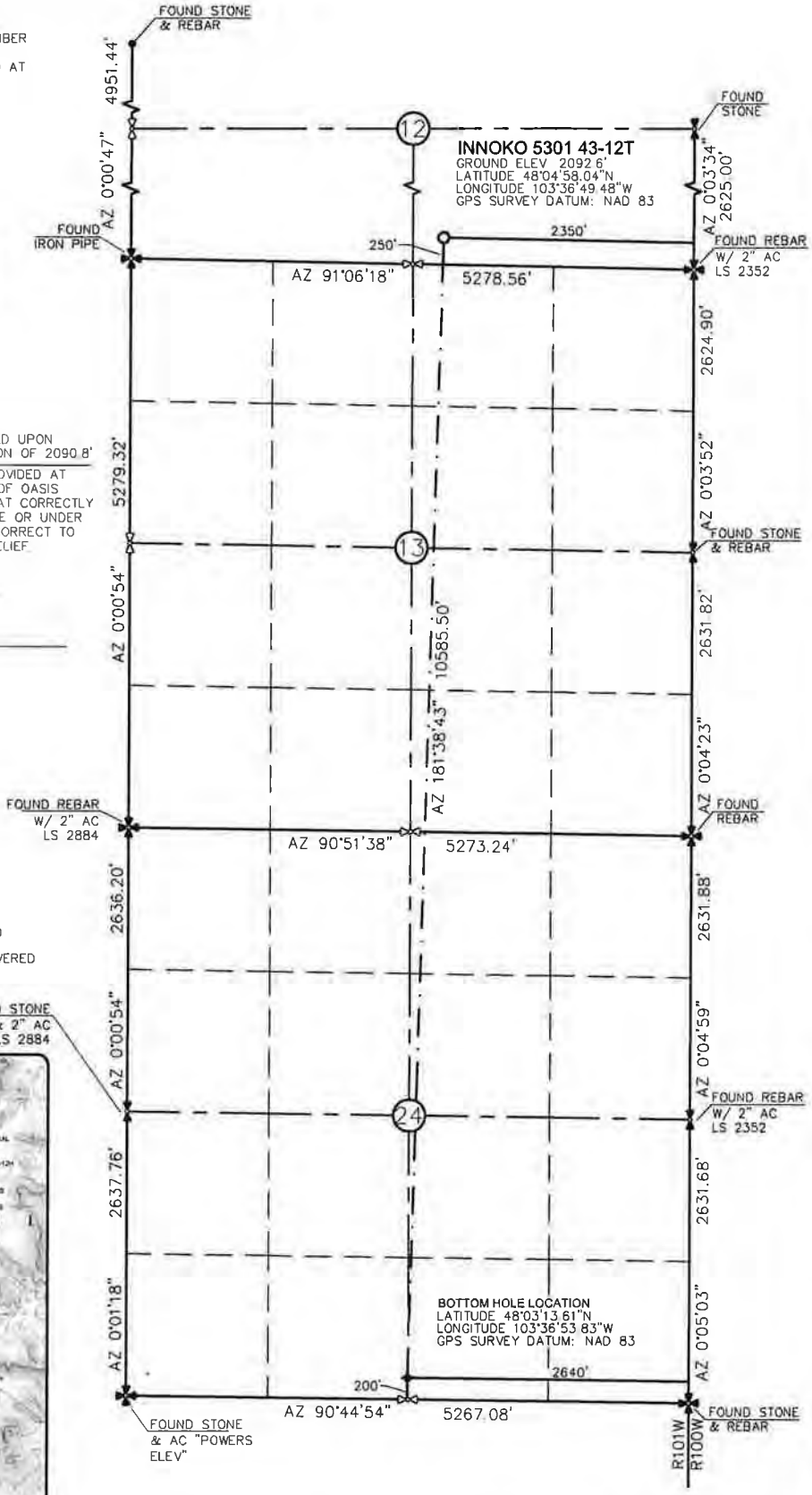
REGISTERED LAND SURVEYOR
DARYL D. KASEMAN
LS-3880
DATE: 6/05/13
NORTH DAKOTA

STAKED ON 12/6/11
VERTICAL CONTROL DATUM WAS BASED UPON CONTROL POINT 13 WITH AN ELEVATION OF 2090.8'

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

DARYL D. KASEMAN, LS-3880



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OASIS PETROLEUM NORTH AMERICA, LLC
WELL LOCATION PLAT
SECTION 12, T153N, R101W

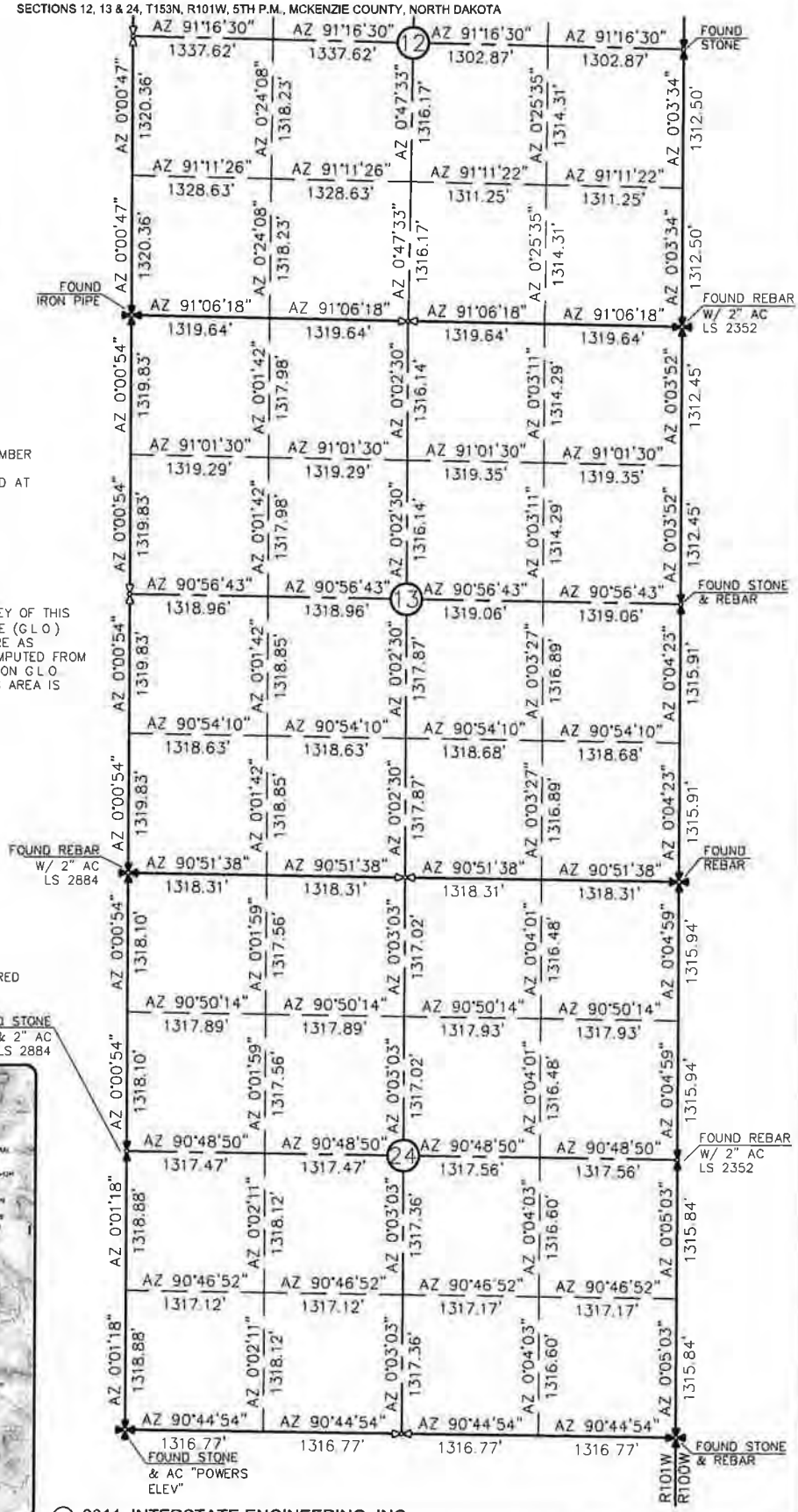
MCKENZIE COUNTY, NORTH DAKOTA

Drawn By: J.J.S. | Project No.: S11-09-381
Checked By: D.D.K. | Date: DEC 2011

Revision No.	Date	By	Description
REV 1	1/13/12	JJS	SHIFTED WELL LOCATIONS
REV 2	2/8/13	BRH	MOVED BOTTOM HOLE / CHANGED NAME
REV 3	2/14/13	JJS	REVISED WELL CALL
REV 4	6/05/13	JJS	MOVED WELL 50'

SECTION BREAKDOWN

OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 1500, HOUSTON, TX 77002
"INNOKO 5301 43-12T"
250 FEET FROM SOUTH LINE AND 2350 FEET FROM EAST LINE
SECTIONS 12, 13 & 24, T153N, R101W, 5TH P.M., MCKENZIE COUNTY, NORTH DAKOTA



REGISTERED LAND SURVEYOR
DARYL D. KASEMAN
LS-3880
DATE: 6/05/13
NORTH DAKOTA

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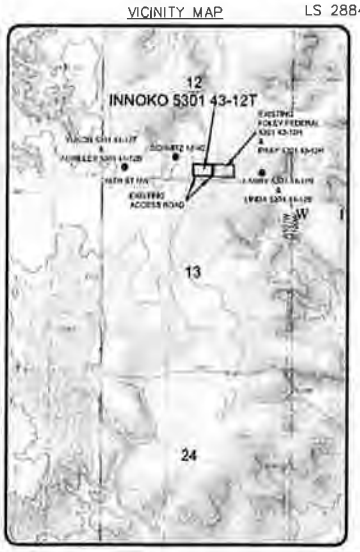
ALL AZIMUTHS ARE BASED ON G P S OBSERVATIONS THE ORIGINAL SURVEY OF THIS AREA FOR THE GENERAL LAND OFFICE (G L O) WAS 1900 THE CORNERS FOUND ARE AS INDICATED AND ALL OTHERS ARE COMPUTED FROM THOSE CORNERS FOUND AND BASED ON G L O DATA THE MAPPING ANGLE FOR THIS AREA IS APPROXIMATELY -0°03'

0 1000
1" = 1000'

✠ - MONUMENT - RECOVERED
✠ - MONUMENT - NOT RECOVERED

VICINITY MAP



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Sidney, Montana 59270
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Fax (406) 433-5618
www.interstateeng.com
Other offices in Minnesota, North Dakota and South Dakota

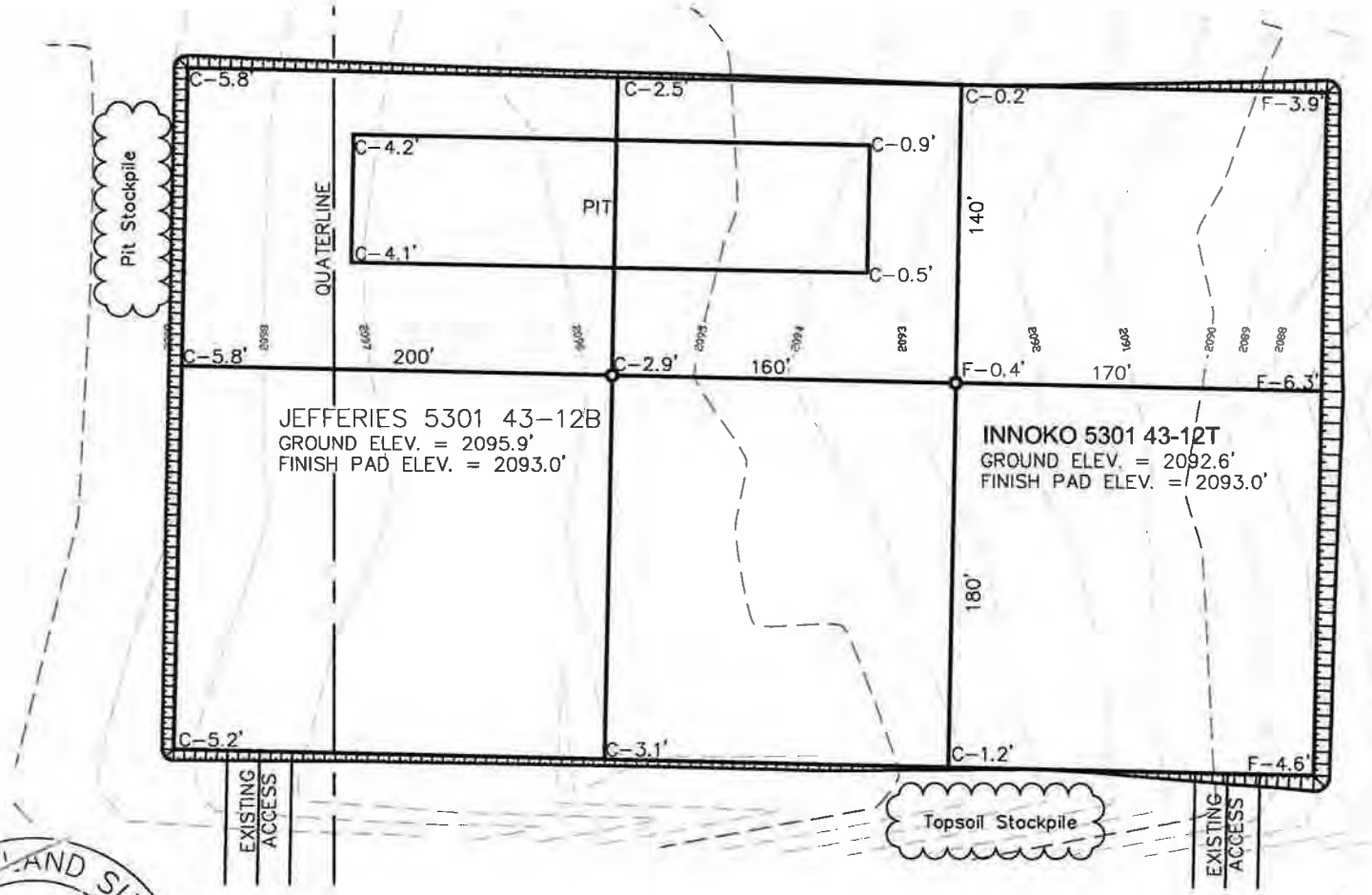
OASIS PETROLEUM NORTH AMERICA, LLC
SECTION BREAKDOWN
SECTIONS 12, 13 & 24, T153N, R101W
MCKENZIE COUNTY, NORTH DAKOTA

Drawn By: J.J.S. Project No.: 511-09-361
Checked By: D.D.K. Date: DEC 2011

Revision No.	Date	By	Description
REV 1	1/19/12	JJS	SHIFTED WELL LOCATIONS
REV 2	2/5/13	BKH	MOVED BOTTOM HOLE / CHANGED NAME
REV 3	4/05/13	JJS	MOVED WELL 60'

PAD LAYOUT

OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 1500, HOUSTON, TX 77002
"INNOKO 5301 43-12T"
250 FEET FROM SOUTH LINE AND 2350 FEET FROM EAST LINE
SECTION 12, T153N, R101W, 5TH P.M., MCKENZIE COUNTY, NORTH DAKOTA



REGISTERED LAND SURVEYOR
DARYL D. KASEMAN
LS-3880
DATE: 6/05/13
NORTH DAKOTA

THIS DOCUMENT WAS ORIGINALLY ISSUED AND SEALED BY DARYL D. KASEMAN, PLS, REGISTRATION NUMBER 3880 ON 6/05/13 AND THE ORIGINAL DOCUMENTS ARE STORED AT THE OFFICES OF INTERSTATE ENGINEERING, INC.

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

0 80
1" = 80'

Revision No.	Date	By	Description
REV 1	1/24/13	JAS	SHIFTED WELL LOCATIONS
REV 2	2/5/13	BWH	MOVED BOTTOM HOLE / CHANGED NAME
REV 4	6/05/13	JAS	MOVED WELL 60'

OASIS PETROLEUM NORTH AMERICA, LLC
PAD LAYOUT
SECTION 12, T153N, R101W
MCKENZIE COUNTY, NORTH DAKOTA

Drawn By: J.J.S. Project No.: S11-2-391
Checked By: D.D.K. Date: DEC 2011

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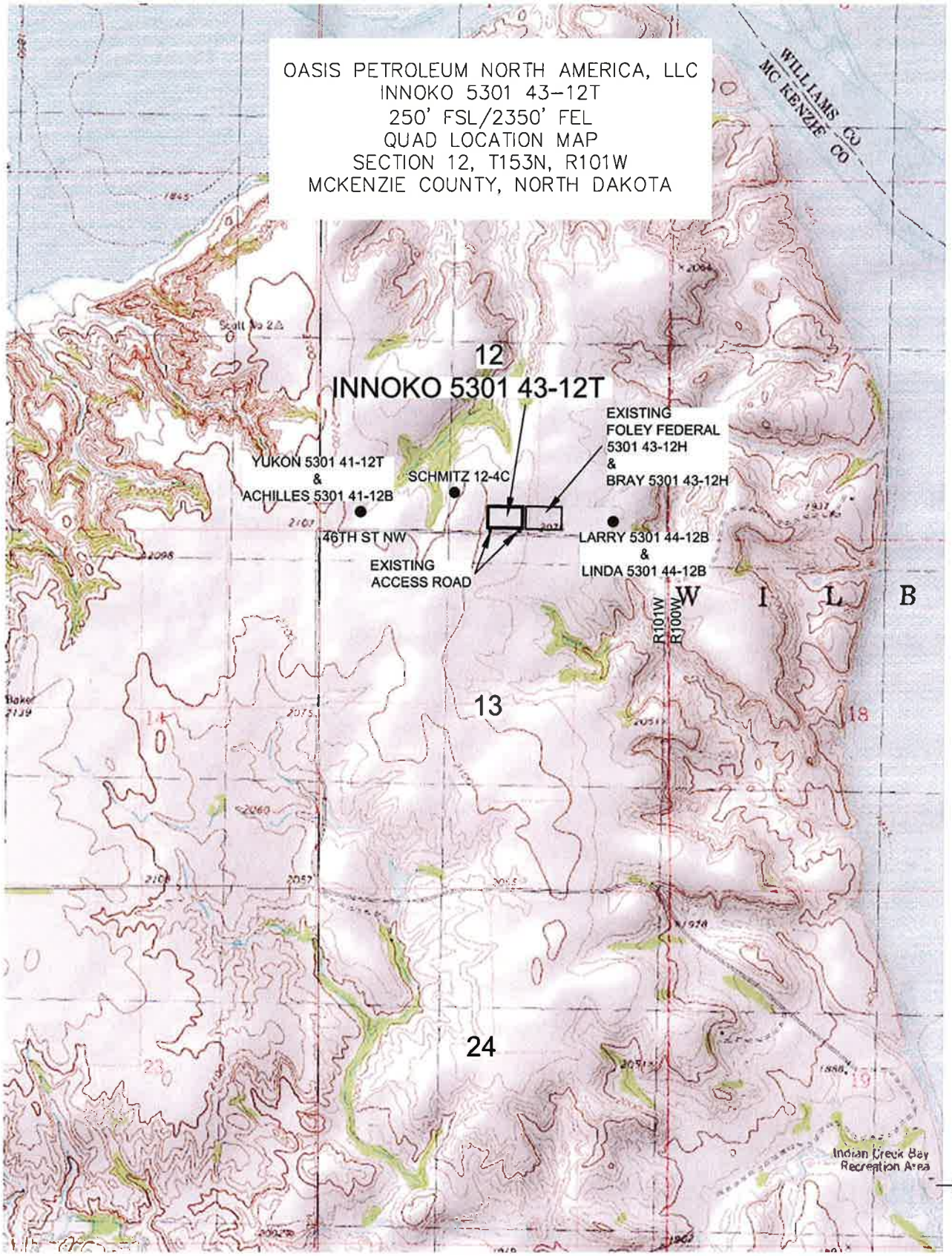

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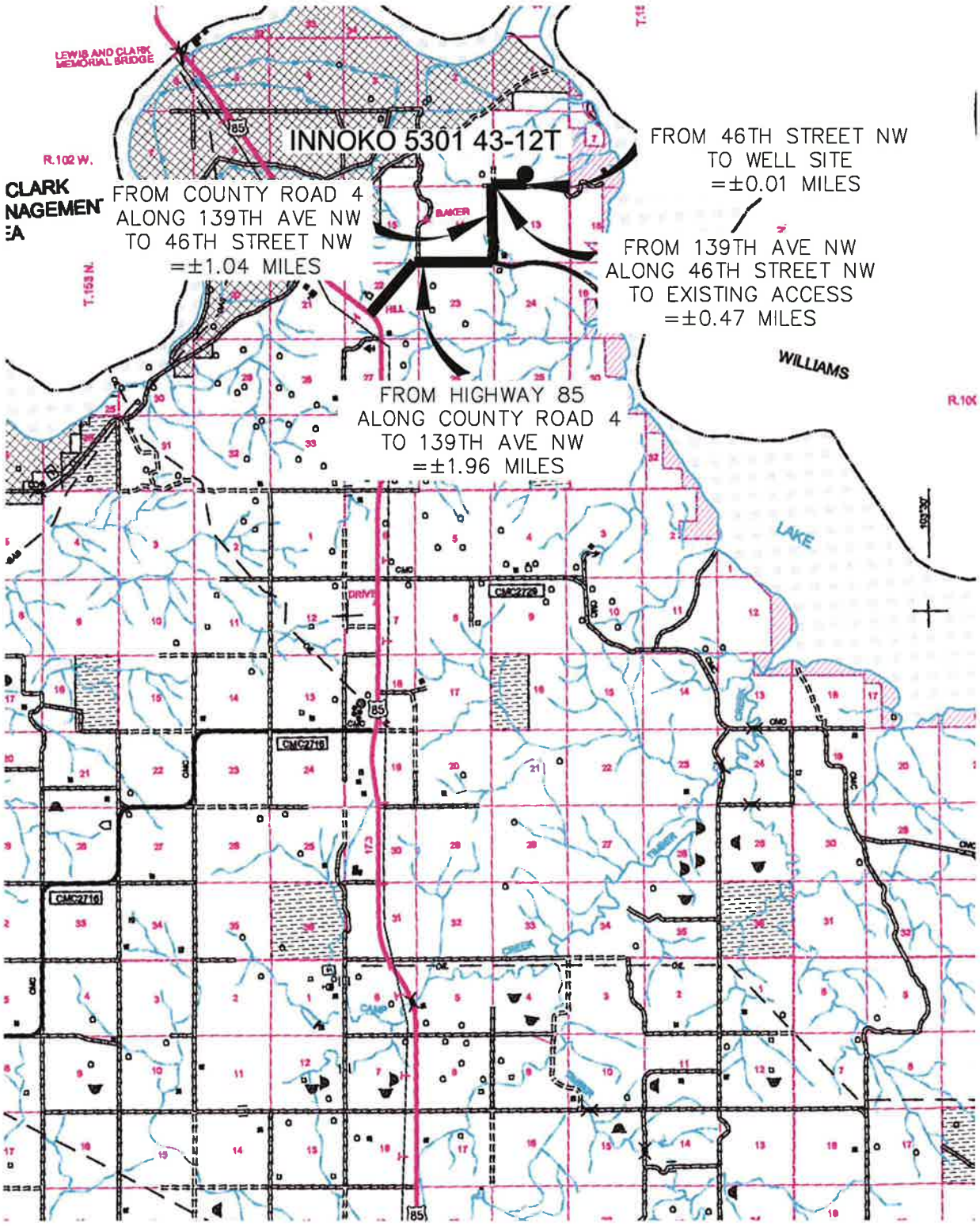
OASIS PETROLEUM NORTH AMERICA, LLC
QUAD LOCATION MAP
SECTION 12, T153N, R101W
MCKENZIE COUNTY, NORTH DAKOTA

Drawn By: J.J.S. | Project No.: S11-09-361
Checked By: D.D.K. | Date: DEC 2011

Revision No.	Date	By	Description
REV 1	1/19/12	JJS	SNAPPED WELL LOCATIONS
REV 2	2/3/12	BKH	MOVED BOTTOM HOLE / CHANGED NAME
REV 3	8/05/12	JJS	MOVED WELL 80'

COUNTY ROAD MAP

OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 1500, HOUSTON, TX 77002
"INNOKO 5301 43-12T"
250 FEET FROM SOUTH LINE AND 2350 FEET FROM EAST LINE
SECTION 12, T153N, R101W, 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 12, T153N, R101W
MCKENZIE COUNTY, NORTH DAKOTA

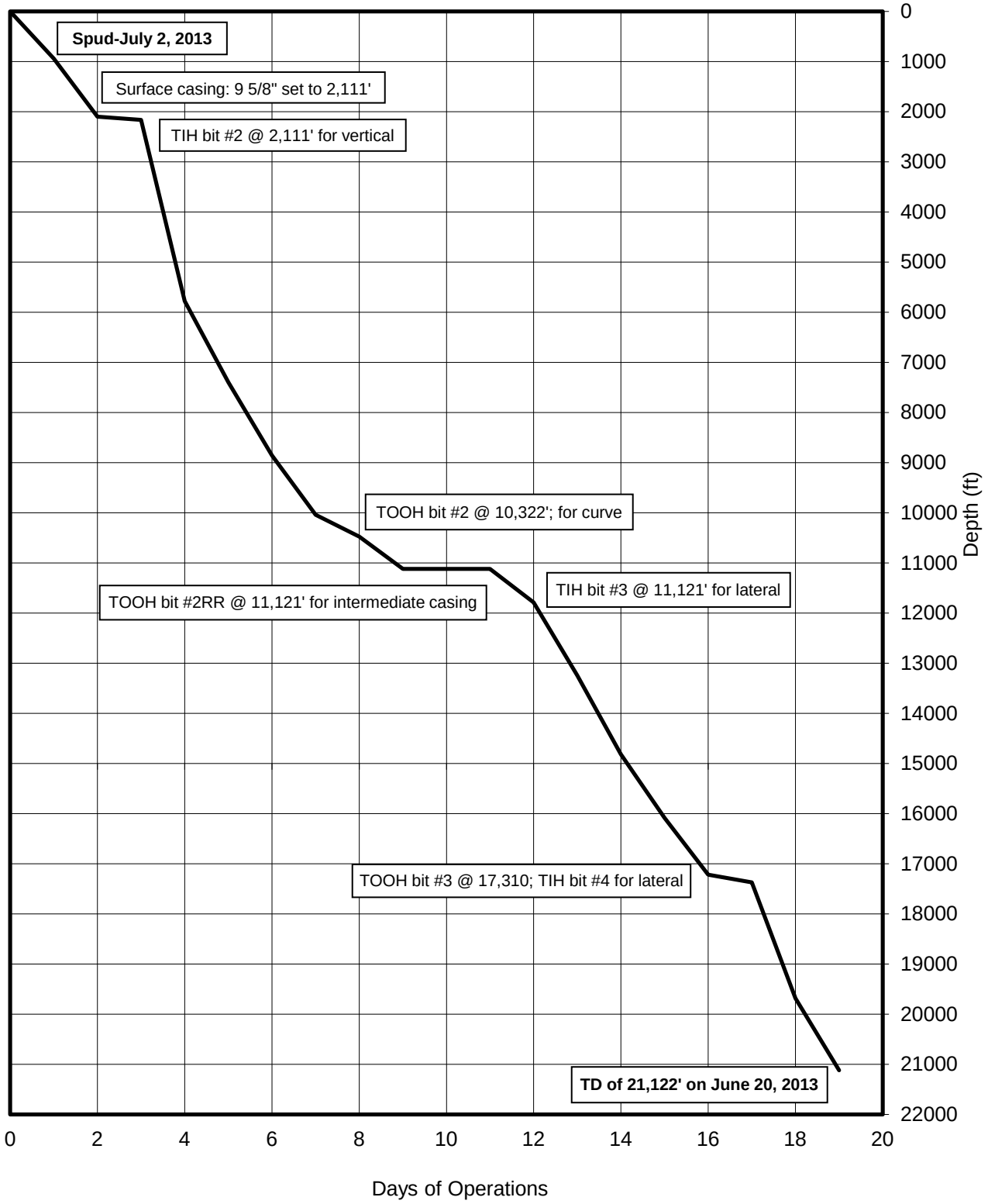
Drawn By: J.J.S. | Project No.: S11-09-361
Checked By: D.D.K. | Date: DEC 2011

Revision No.	Date	By	Description
REV 1	1/19/12	JJS	SNAPPED WELL LOCATIONS
REV 2	2/3/12	BHH	MOVED BOTTOM HOLE / CHANGED NAME
REV 4	6/05/13	JJS	MOVED WELL 60'

TIME VS DEPTH

Oasis Petroleum North America, LLC

Innoko 5301 43-12T



DAILY DRILLING SUMMARY

Day	Date 2013	Depth (0600 Hrs)	24 Hr Footage	Bit #	WOB (Klbs) RT	WOB (Klbs) MM	RPM (RT)	RPM (MM)	PP	SPM 1	SPM 2	GPM	24 Hr Activity	Formation
0	7/1	-	-	-	-	-	-	-	-	-	-	-	Rig up.	-
1	7/2	940'	-	2	15	-	170	-	900	100	100	551	P/U drill pipe, change rotating head/rubber, formation integrity test (FIT) 150 PSI, drill F/0 to 940	Surface
2	7/3	2,100'	1,160	2	30	-	170	-	1700	100	100	551	Drill F/155-2100, TOOH, wait on tools, TIH	Surface
3	7/4	2,165'	65	2	30	-	170	-	1600	100	100	551	D/2100 to 2165, circulate and condition, TOOH, L/D BHA, run casing, cementing, nipple up BOP	Surface
4	7/5	5,780'	3,615	2	17	-	45	-	3800	80	80	537	Drill F/2165 to 5780	Dakota
5	7/6	7,395'	1,615	2	17	-	45	-	3600	80	80	537	Drill F/5780 to 7395	Opeche Salt
6	7/7	8,856'	1,461	2	25	-	45	-	3700	80	80	537	Drill F/7395 to 8856	Charles
7	7/8	10,038'	1,182	2	36	8	45	135	4021	80	80	537	Drill F/8856 to 10300	Mission Canyon
8	7/9	10,477'	439	2	35	28	45	135	3980	78	78	530	Drill 8,935'-10,300', TOOH, Pick up BHA, TIH, Drill 10,300'-10,477'	Lodgepole
9	7/10	11,121'	644	2	35	28	45	135	3980	78	78	530	Drill 10,300'-11,121', short trip, circulate and condition, L/D DP	Three Forks
10	7/11	11,121'	0	2	35	28	45	135	3980	78	78	530	Run casing, circulate and condition, primary cementing	Three Forks
11	7/12	11,121'	0	2	35	28	45	135	3980	78	78	530	P/U drill pipe, service rig, TIH, reaming/washing F/10618 to 10807	Three Forks
12	7/13	11,790'	669	3	18	47	40	135	2292	-	80	275	pressure test, pick up BHA, TIH, Drill 11,121'-11,790'	Three Forks
13	7/14	13,245'	1,455	3	27	47	40	135	2616	80	-	275	Rotary Drilling F/11,861'-13,245'	Three Forks
14	7/15	14,820'	1,575	3	27	60	40	135	3120	80	-	275	Rotary Drilling F/12,945'-14,820'	Three Forks
15	7/16	16,085'	1,265	3	27	60	40	135	3120	80	-	275	Rotary Drilling F/14,875'-16,085'	Three Forks
16	7/17	17,220'	1,135	3	27	60	40	135	3120	80	-	275	Rotary Drilling F/16,067'-17,220'	Three Forks
17	7/18	17,371'	151	4	27	60	45	276	3750	80	-	275	TIH, circulate and condtion, TIH, drill F/16067 to 17371	Three Forks
18	7/19	19,685'	2,314	4	20	41	40	135	3560	-	80	275	Drill 18,861'-19,685'	Three Forks
19	7/20	21,122'	1,437	4	20	55	40	135	3600	80	-	275	Drill F/19579 to 21122, circulate and condition, TOOH	Three Forks

DAILY MUD SUMMARY

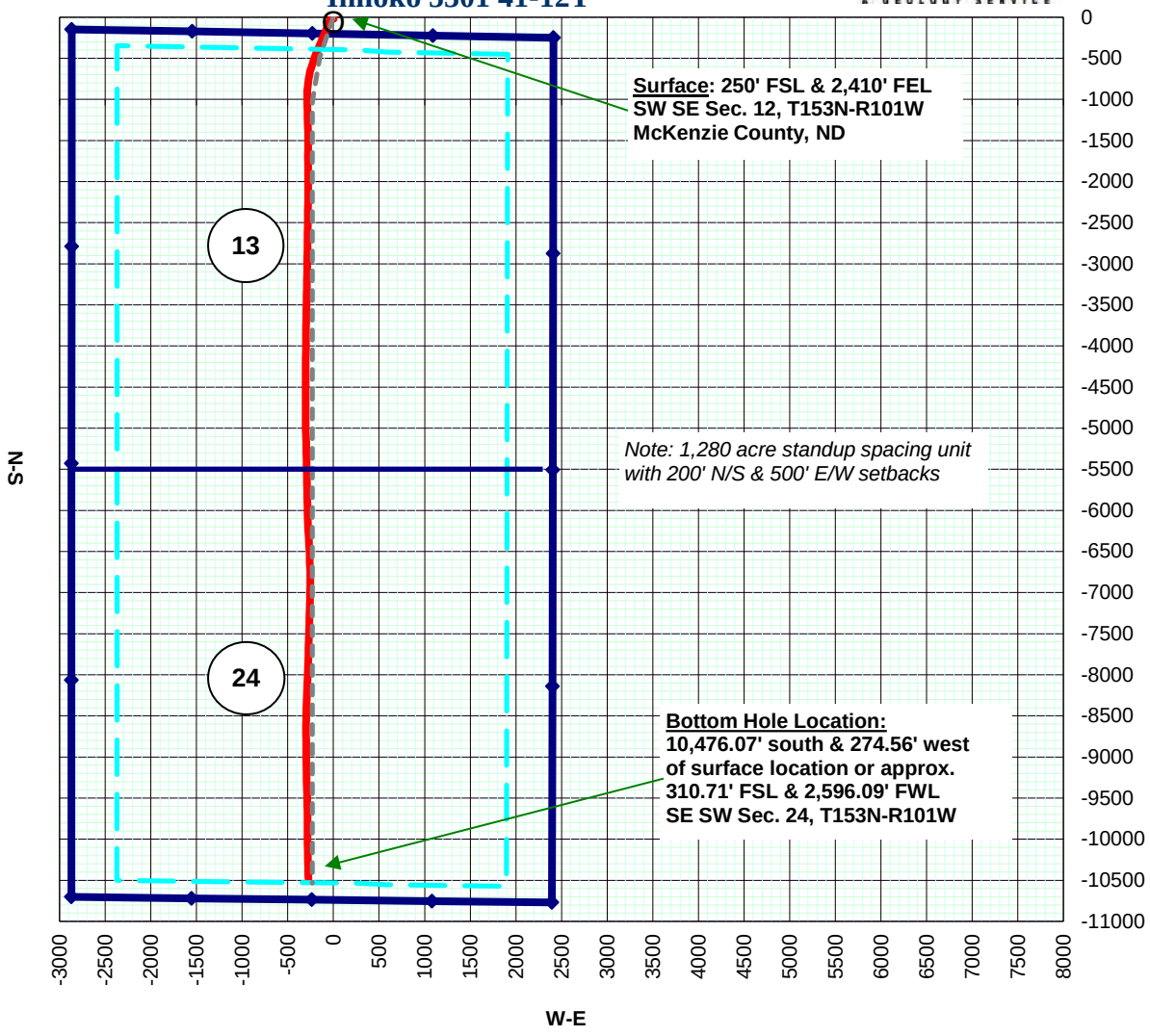
Day	Date 2013	Mud Depth	Mud WT (ppg)	VIS (sec/ qt)	PV (cP)	YP (lbs/ 100 ft2)	Gels (lbs/ 100 ft^2)	600/ 300	NAP/ H_20 (ratio)	NAP/ H20 (% by vol)	Cake (API/ HTHP)	Cor. Solids (%)	Oil/ H_20 (%)	Alk	pH	Excess Lime (lb/bbl)	Cl^- (mg/L)	LGS/ HGS (%)	Salinity (ppm)	ES	Gain/ Loss (bbls)
0	07/02	2,078'	9.7	73	13	4	8/13/-	30/17	82.7/17.3	-	2	11.5	71.5/15	1.2	-	1.6	42k	8.2/3.3	264,320	810	-/-
1	07/03	2,598'	9.6	63	21	9	9/15-	51/30	74/26	-	3	9.4	65.5/23	1	-	1.3	34k	7.3/2.2	264,320	432	-/-
2	07/04	2,598'	9.6	63	21	9	9/15-	51/30	74/26	-	3	9.4	65.5/23	1	-	1.3	34k	7.3/2.2	264,320	432	-/13
3	07/05	6,038'	9.72	51	19	8	8/13/-	46/27	77/23	-	3	11	67/20	1.6	-	2.1	33k	5.6/5.4	213,787	477	-/89
4	07/06	7,578'	9.65	48	17	7	7/12/-	41/24	81.5/18.5	-	3	11.5	70.5/16	1.8	-	2.3	33k	5.6/5.9	264,320	655	-/108
5	07/07	9,028'	9.88	47	19	8	9/14/-	46/27	81.8/18.2	-	3	12.9	69.5/15.5	1.5	-	1.9	34k	7.9/5.0	264,320	0	-/69
6	07/08	10,192'	10.1	45	21	11	12/18/-	53/32	81/19	-	3	13.9	68/16	1.2	-	1.6	34k	8.7/5.2	264,320	596	-/69
7	07/09	10,609'	10.28	20	22	12	12/19/-	56/34	80.1/19.9	-	3	14.9	66.5/16.5	1	-	1.3	34k	9/5.9	259,369	599	-/84
8	07/10	11,121'	10.6	62	20	11	11/18/-	51/31	805/19.5	-	3	15.9	66/16	1.7	-	2.2	35k	10.5/5.4	259,026	634	-/74
9	07/11	Change mud from diesel invert to salt water																			
10	07/12	11,121'	9.7	26	1	1	-	3/2	-	0.5/90	-	-	0.5/90	-	9	-	153k	0/0.4	-	-	-/-
11	07/13	12,138'	9.7	26	1	1	-	3/2	-	0.5/90	-	-	0.5/90	-	9	-	153k	0/0.4	-	-	-/74
12	07/14	13,423'	9.7	26	1	1	-	3/2	-	0.5/90	-	-	0.5/90	-	8.6	-	151k	0/0.5	-	-	-/74
13	07/15	13,423'	9.7	26	1	1	-	3/2	-	0.5/90	-	-	0.5/90	-	8.6	-	151k	0/0.5	-	-	-/-
14	07/16	13,423'	9.6	26	1	1	-	3/2	-	1/92	-	-	1/92	-	7.5	-	138k	-/0.3	-	-	-/-
15	07/17	13,423'	9.6	26	1	1	-	3/2	-	1/92	-	-	1/92	-	7.5	-	138k	-/0.3	-	-	-/-
16	07/18	17,460'	9.6	26	1	1	-	3/2	-	1/92	-	-	1/92	-	7.5	-	138k	-/0.3	-	-	-/-
17	07/19	17,460'	9.6	26	1	1	-	3/2	-	1/92	-	-	1/92	-	7.5	-	138k	-/0.3	-	-	-/-
18	07/20	21,122'	9.6	26	1	1	-	3/2	-	1/92	-	-	1/92	-	7.5	-	138k	-/0.3	-	-	-/-

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	Bend	Hours	Rev/Gal
2	2,111'	11,121'	9,010'	100.5	100.50	Vertical/Curve	2	8 3/4	PDC	Smith	MSI616	JG4960	6x16	79	2	Huntington	1.50°	100.5	0.24
3	11,121'	17,310'	6,189'	105	205.50	Lateral	3	6	PDC	NOV	SKHI613M	A177288	6x20	105	3	Huntington	1.50°	105	0.49
4	17,310'	21,122'	3,812'	60	265.50	Lateral	4	6	PDC	Varel	VM613P2	4004837	6x20	60	4	NOV	1.86°	60	0.29

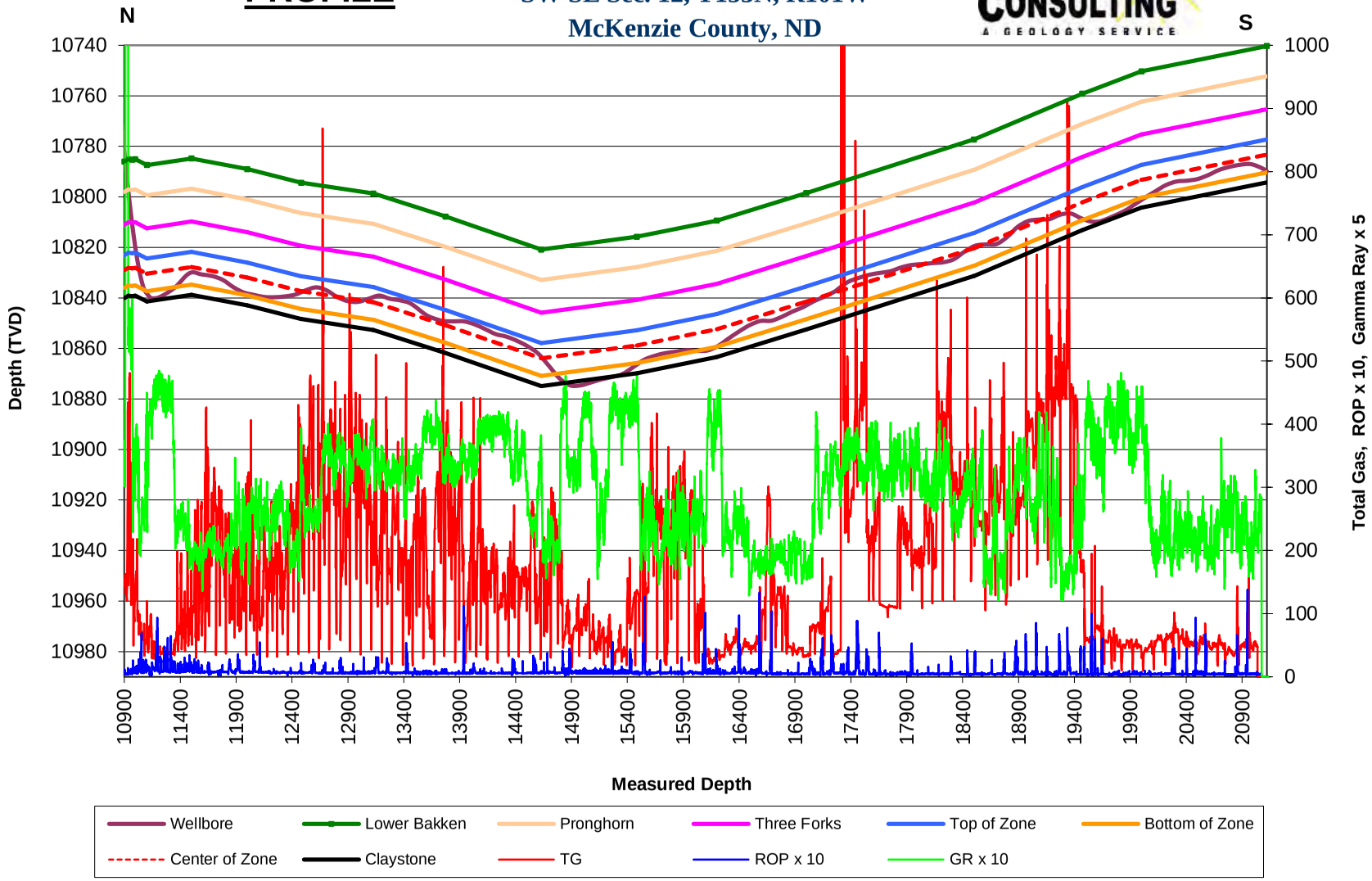
PLAN VIEW

Oasis Petroleum North America, LLC
Innoko 5301 41-12T



Oasis Petroleum North America, LLC
Innoko 5301 41-12T
SW SE Sec. 12, T153N, R101W
McKenzie County, ND

PROFILE



FORMATION MARKERS & DIP ESTIMATES

Oasis Petroleum North America, LLC - Innoko 5301 41-12T

Dip Change Points	MD	TVD	TVD diff.	MD diff.	Dip	Dipping up/down	Type of Marker
Marker							
	11,102'	10,787.40					Gamma
Cool Gamma Marker	11,500'	10,784.80	-2.60	398.00	***0.37***	Up	Gamma
Cool Gamma Marker	12,000'	10,789.00	4.20	500.00	***-0.48***	Down	Gamma
Center of Target	12,482'	10,794.40	5.40	482.00	***-0.64***	Down	Gamma
Top of Target	13,127'	10,798.70	4.30	645.00	***-0.38***	Down	Gamma
Top of Target	13,775'	10,807.80	9.10	648.00	***-0.80***	Down	Gamma
Center of Target	14,630'	10,820.90	13.10	855.00	***-0.88***	Down	Gamma
Warm Gamma Marker	15,485'	10,815.80	-5.10	855.00	***0.34***	Up	Gamma
Base of Target	16,200'	10,809.40	-6.40	715.00	***0.51***	Up	Gamma
Center of Target	17,000'	10,798.50	-10.90	800.00	***0.78***	Up	Gamma
Center of Target	18,500'	10,777.30	-21.20	1500.00	***0.81***	Up	Gamma
Base of Target	19,470'	10,759.20	-18.10	970.00	***1.07***	Up	Gamma
Cool Gamma Marker	20,000'	10,750.30	-8.90	530.00	***0.96***	Up	Gamma
	21,122'	10,740.30	-10.00	1122.00	***0.51***	Up	Gamma
Gross Dip							
Initial Target Contact	11,102'	10,787.40					
Projected Final Target Contact	21,122'	10,740.30	-47.10	10020.00	***0.27***	Up	Projection

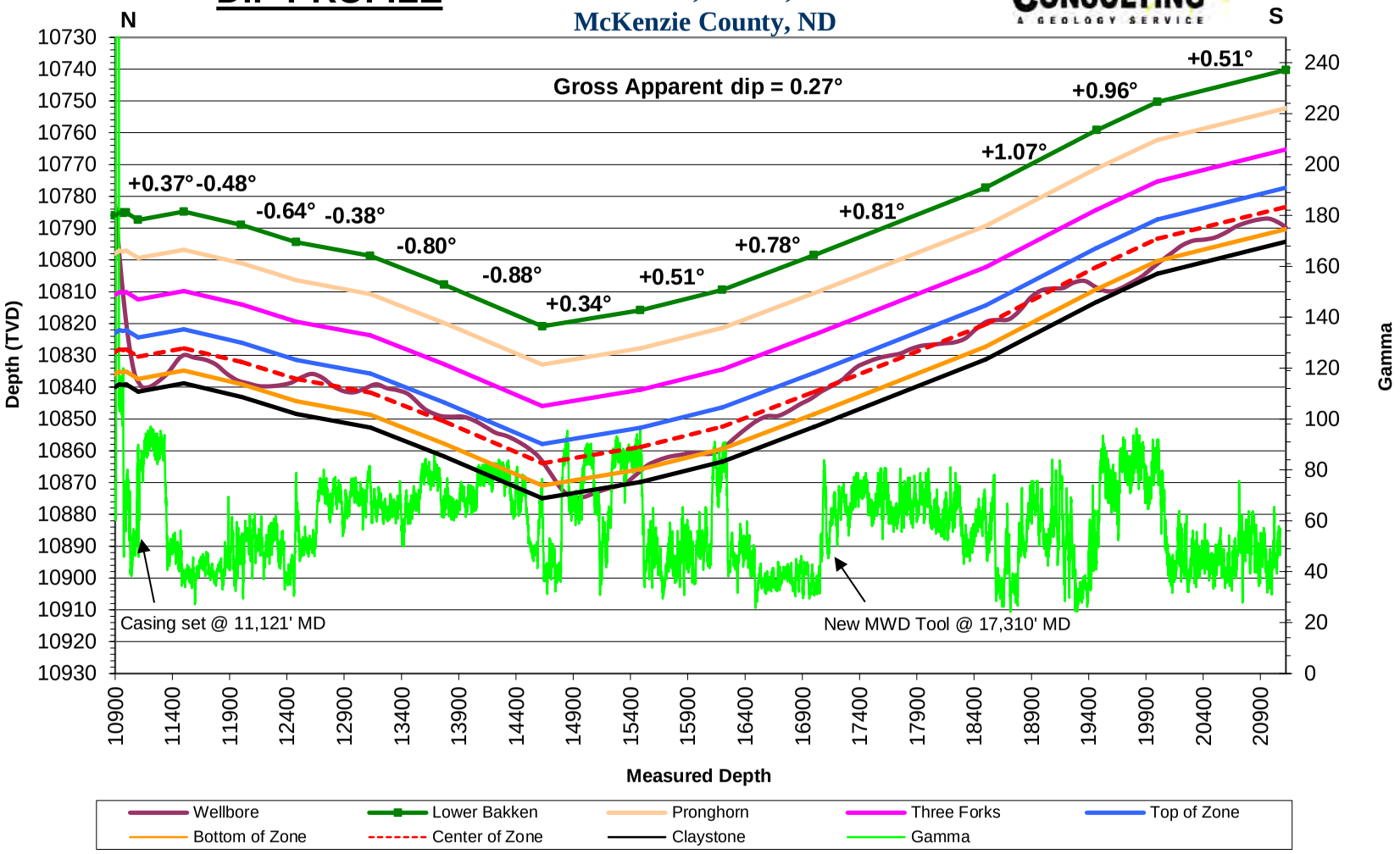
* = GR / electric log confirmation

Other markers based on natural deflections & drill rate changes

DIP PROFILE

Oasis Petroleum North America, LLC
Innoko 5301 41-12T
SW SE Sec. 12, T153N, R101W
McKenzie County, ND

SUNBURST CONSULTING
A GEOLOGY SERVICE



SUNBURST CONSULTING, INC.

Operator:	Oasis Petroleum North America, LLC		
Well :	Innoko 5301 41-12T		
County:	McKenzie	State:	ND
QQ:	SW SE	Section:	12
Township:	153	N/S:	N
Range:	101	E/W:	W
Footages:	250	FN/SL:	S
	2410	FE/WL:	E

Kick-off:	7/8/2013
Finish:	7/20/2013
Directional Supervision:	
Leam Drilling Systems	
Date:	7/23/2013
Time:	11:11
F9 to re-calculate	
Proposed dir:	181.25

Minimum Curvature Method (SPE-3362)

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

No.	MD	INC	TRUE AZM	TVD	N-S	E-W	SECT	DLS/ 100
Tie	2128.00	0.59	184.46	2127.95	-6.86	4.04	6.74	0.51
1	2187.00	1.40	197.30	2186.94	-7.85	3.80	7.77	1.42
2	2280.00	1.50	175.30	2279.91	-10.15	3.56	10.07	0.60
3	2373.00	1.00	185.40	2372.89	-12.17	3.59	12.09	0.59
4	2466.00	1.10	184.50	2465.87	-13.87	3.44	13.79	0.11
5	2560.00	1.40	189.60	2559.85	-15.90	3.18	15.83	0.34
6	2653.00	1.10	243.70	2652.83	-17.42	2.19	17.36	1.26
7	2746.00	1.30	231.40	2745.81	-18.47	0.56	18.45	0.35
8	2839.00	1.20	236.20	2838.79	-19.67	-1.07	19.69	0.16
9	2933.00	0.90	243.90	2932.77	-20.54	-2.55	20.59	0.35
10	3026.00	1.00	258.30	3025.76	-21.03	-4.00	21.11	0.28
11	3119.00	0.80	258.50	3118.75	-21.32	-5.43	21.43	0.22
12	3212.00	1.00	269.60	3211.74	-21.46	-6.88	21.60	0.28
13	3306.00	0.90	280.40	3305.73	-21.33	-8.43	21.51	0.22
14	3399.00	0.90	288.00	3398.71	-20.97	-9.84	21.18	0.13
15	3492.00	1.00	294.30	3491.70	-20.41	-11.27	20.65	0.16
16	3585.00	0.80	306.10	3584.69	-19.70	-12.54	19.96	0.29
17	3679.00	0.90	304.70	3678.68	-18.89	-13.67	19.18	0.11
18	3772.00	0.90	305.80	3771.67	-18.05	-14.87	18.37	0.02
19	3864.00	0.70	4.50	3863.66	-17.06	-15.41	17.39	0.87
20	3957.00	0.90	17.70	3956.65	-15.80	-15.14	16.13	0.29
21	4051.00	1.10	89.90	4050.64	-15.10	-14.02	15.40	1.27
22	4144.00	1.10	92.90	4143.62	-15.14	-12.23	15.40	0.06
23	4237.00	0.90	101.50	4236.61	-15.33	-10.62	15.56	0.27
24	4331.00	0.50	93.40	4330.60	-15.50	-9.49	15.70	0.44
25	4424.00	0.40	88.10	4423.60	-15.51	-8.76	15.70	0.12
26	4517.00	0.40	75.00	4516.60	-15.42	-8.12	15.59	0.10
27	4610.00	0.30	77.90	4609.59	-15.28	-7.57	15.45	0.11
28	4704.00	0.10	64.80	4703.59	-15.20	-7.26	15.35	0.22
29	4797.00	0.20	57.00	4796.59	-15.07	-7.05	15.23	0.11
30	4890.00	0.30	71.40	4889.59	-14.91	-6.68	15.05	0.13
31	4983.00	0.10	62.70	4982.59	-14.79	-6.38	14.93	0.22
32	5076.00	0.50	15.70	5075.59	-14.37	-6.20	14.50	0.47
33	5170.00	0.70	55.30	5169.59	-13.64	-5.61	13.76	0.48
34	5263.00	0.30	163.40	5262.58	-13.55	-5.08	13.66	0.91
35	5356.00	0.60	153.40	5355.58	-14.22	-4.79	14.32	0.33

SUNBURST CONSULTING, INC.

Operator:	Oasis Petroleum North America, LLC			Kick-off:	7/8/2013
Well :	Innoko 5301 41-12T			Finish:	7/20/2013
County:	McKenzie	State:	ND	Directional Supervision:	
QQ:	SW SE	Section:	12	Leam Drilling Systems	
Township:	153	N/S:	N		
Range:	101	E/W:	W	Date:	7/23/2013
Footages:	250	FN/SL:	S	Time:	11:11
	2410	FE/WL:	E	**F9 to re-calculate**	

Minimum Curvature Method (SPE-3362) Proposed dir: 181.25

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

No.	MD	INC	TRUE AZM	TVD	N-S	E-W	SECT	DLS/ 100
36	5450.00	0.30	175.70	5449.58	-14.91	-4.55	15.00	0.36
37	5543.00	0.30	200.50	5542.58	-15.38	-4.62	15.48	0.14
38	5636.00	0.90	213.70	5635.57	-16.22	-5.11	16.32	0.66
39	5729.00	1.00	212.60	5728.56	-17.51	-5.95	17.63	0.11
40	5822.00	1.00	210.10	5821.54	-18.89	-6.79	19.04	0.05
41	5916.00	0.50	243.40	5915.54	-19.79	-7.57	19.95	0.68
42	6009.00	0.90	247.20	6008.53	-20.25	-8.61	20.43	0.43
43	6102.00	1.10	252.30	6101.51	-20.80	-10.13	21.02	0.24
44	6196.00	1.40	320.00	6195.50	-20.20	-11.73	20.45	1.50
45	6289.00	1.90	345.80	6288.46	-17.83	-12.84	18.11	0.95
46	6382.00	2.50	6.60	6381.39	-14.32	-12.98	14.60	1.06
47	6475.00	2.00	6.10	6474.32	-10.70	-12.58	10.97	0.54
48	6568.00	1.50	351.80	6567.28	-7.88	-12.58	8.15	0.71
49	6662.00	1.20	345.70	6661.25	-5.71	-13.00	5.99	0.35
50	6755.00	0.50	38.00	6754.24	-4.44	-12.99	4.73	1.05
51	6848.00	1.10	201.70	6847.24	-4.95	-13.07	5.24	1.71
52	6941.00	1.20	213.10	6940.22	-6.60	-13.93	6.90	0.27
53	7035.00	1.00	232.80	7034.20	-7.92	-15.12	8.25	0.45
54	7128.00	0.90	233.90	7127.19	-8.84	-16.36	9.19	0.11
55	7221.00	0.80	255.30	7220.18	-9.43	-17.58	9.82	0.36
56	7314.00	0.30	204.00	7313.17	-9.82	-18.30	10.22	0.71
57	7408.00	0.10	94.60	7407.17	-10.05	-18.32	10.45	0.37
58	7501.00	0.20	152.50	7500.17	-10.20	-18.17	10.60	0.18
59	7594.00	0.30	170.20	7593.17	-10.59	-18.05	10.98	0.13
60	7687.00	0.30	129.50	7686.17	-10.98	-17.82	11.37	0.22
61	7781.00	0.00	173.80	7780.17	-11.14	-17.63	11.52	0.32
62	7874.00	0.10	272.90	7873.17	-11.13	-17.71	11.52	0.11
63	7967.00	0.40	14.80	7966.17	-10.82	-17.71	11.20	0.46
64	8060.00	0.50	333.40	8059.17	-10.14	-17.81	10.53	0.36
65	8153.00	0.60	316.50	8152.16	-9.42	-18.33	9.82	0.20
66	8247.00	0.60	321.40	8246.16	-8.68	-18.97	9.09	0.05
67	8340.00	0.70	348.30	8339.15	-7.75	-19.39	8.17	0.34
68	8433.00	0.70	5.50	8432.14	-6.62	-19.45	7.05	0.23
69	8526.00	0.70	13.60	8525.14	-5.51	-19.26	5.92	0.11
70	8620.00	0.60	13.60	8619.13	-4.47	-19.01	4.88	0.11
71	8713.00	0.50	6.10	8712.13	-3.59	-18.85	4.00	0.13

SUNBURST CONSULTING, INC.

Operator:	Oasis Petroleum North America, LLC			Kick-off:	7/8/2013
Well :	Innoko 5301 41-12T			Finish:	7/20/2013
County:	McKenzie	State:	ND	Directional Supervision:	
QQ:	SW SE	Section:	12	Leam Drilling Systems	
Township:	153	N/S:	N		
Range:	101	E/W:	W	Date:	7/23/2013
Footages:	250	FN/SL:	S	Time:	11:11
	2410	FE/WL:	E	**F9 to re-calculate**	

Minimum Curvature Method (SPE-3362) Proposed dir: 181.25

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

No.	MD	INC	TRUE AZM	TVD	N-S	E-W	SECT	DLS/ 100
72	8806.00	0.60	22.80	8805.12	-2.74	-18.62	3.15	0.20
73	8899.00	0.60	45.80	8898.12	-1.95	-18.09	2.35	0.26
74	8992.00	0.50	55.30	8991.11	-1.38	-17.40	1.76	0.15
75	9086.00	0.40	44.40	9085.11	-0.91	-16.84	1.28	0.14
76	9179.00	0.50	50.50	9178.11	-0.42	-16.30	0.78	0.12
77	9272.00	1.10	45.40	9271.10	0.46	-15.35	-0.13	0.65
78	9366.00	1.20	42.40	9365.08	1.82	-14.04	-1.52	0.12
79	9459.00	0.10	109.40	9458.07	2.51	-13.31	-2.22	1.25
80	9552.00	0.10	5.50	9551.07	2.57	-13.22	-2.28	0.17
81	9645.00	0.20	334.90	9644.07	2.80	-13.28	-2.51	0.13
82	9739.00	0.40	330.20	9738.07	3.23	-13.52	-2.93	0.21
83	9832.00	0.40	312.40	9831.07	3.73	-13.92	-3.43	0.13
84	9925.00	0.40	301.40	9924.07	4.12	-14.43	-3.80	0.08
85	10018.00	0.40	287.70	10017.06	4.39	-15.02	-4.06	0.10
86	10111.00	0.80	291.30	10110.06	4.72	-15.93	-4.37	0.43
87	10205.00	0.80	265.20	10204.05	4.90	-17.20	-4.53	0.38
88	10303.00	2.30	210.30	10302.02	3.15	-18.87	-2.74	1.99
89	10335.00	6.80	199.10	10333.91	0.80	-19.82	-0.37	14.27
90	10366.00	12.00	200.10	10364.48	-3.96	-21.53	4.43	16.78
91	10397.00	16.20	201.50	10394.54	-11.01	-24.22	11.54	13.59
92	10428.00	21.20	202.20	10423.89	-20.23	-27.93	20.84	16.14
93	10459.00	23.50	203.30	10452.56	-31.10	-32.49	31.80	7.54
94	10490.00	25.70	204.00	10480.75	-42.92	-37.67	43.73	7.16
95	10521.00	25.80	205.40	10508.67	-55.15	-43.30	56.09	1.99
96	10552.00	27.50	203.80	10536.38	-67.80	-49.08	68.85	5.95
97	10583.00	30.20	202.90	10563.53	-81.53	-55.00	82.71	8.82
98	10614.00	32.00	199.10	10590.07	-96.48	-60.73	97.78	8.59
99	10645.00	35.00	197.30	10615.92	-112.73	-66.06	114.15	10.19
100	10676.00	38.20	197.80	10640.80	-130.35	-71.63	131.88	10.37
101	10707.00	41.40	200.10	10664.62	-149.11	-78.09	150.78	11.36
102	10739.00	44.10	200.50	10688.12	-169.48	-85.63	171.31	8.48
103	10770.00	47.50	201.00	10709.72	-190.26	-93.50	192.25	11.03
104	10801.00	51.50	201.20	10729.85	-212.25	-101.99	214.42	12.91
105	10832.00	55.80	200.50	10748.22	-235.57	-110.87	237.94	13.99
106	10863.00	59.70	199.20	10764.76	-260.23	-119.76	262.78	13.07
107	10894.00	63.50	200.50	10779.50	-285.87	-129.02	288.62	12.80

SUNBURST CONSULTING, INC.

Operator:	Oasis Petroleum North America, LLC			Kick-off:	7/8/2013
Well :	Innoko 5301 41-12T			Finish:	7/20/2013
County:	McKenzie	State:	ND	Directional Supervision:	
QQ:	SW SE	Section:	12	Leam Drilling Systems	
Township:	153	N/S:	N		
Range:	101	E/W:	W	Date:	7/23/2013
Footages:	250	FN/SL:	S	Time:	11:11
	2410	FE/WL:	E	**F9 to re-calculate**	

Minimum Curvature Method (SPE-3362) Proposed dir: 181.25

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

No.	MD	INC	TRUE AZM	TVD	N-S	E-W	SECT	DLS/ 100
108	10925.00	64.70	201.50	10793.05	-311.90	-139.02	314.86	4.84
109	10956.00	67.40	201.90	10805.63	-338.22	-149.49	341.41	8.79
110	10987.00	71.50	201.20	10816.51	-365.22	-160.15	368.62	13.39
111	11018.00	75.10	200.50	10825.41	-392.96	-170.72	396.59	11.81
112	11049.00	79.30	199.40	10832.28	-421.37	-181.03	425.22	13.98
113	11080.00	84.00	198.90	10836.78	-450.34	-191.08	454.40	15.24
114	11134.00	89.30	198.00	10839.94	-501.46	-208.14	505.88	9.95
115	11165.00	89.90	197.80	10840.15	-530.95	-217.66	535.58	2.04
116	11196.00	90.70	197.50	10839.99	-560.49	-227.06	565.31	2.76
117	11228.00	91.30	196.10	10839.43	-591.12	-236.31	596.14	4.76
118	11258.00	91.50	194.70	10838.70	-620.04	-244.27	625.22	4.71
119	11289.00	91.60	193.30	10837.86	-650.10	-251.77	655.44	4.53
120	11321.00	91.70	191.10	10836.94	-681.37	-258.53	686.84	6.88
121	11352.00	92.20	190.40	10835.88	-711.80	-264.31	717.40	2.77
122	11383.00	92.70	189.40	10834.56	-742.31	-269.63	748.02	3.60
123	11414.00	92.90	187.80	10833.04	-772.93	-274.26	778.73	5.20
124	11445.00	92.70	186.60	10831.53	-803.65	-278.14	809.52	3.92
125	11476.00	91.50	185.00	10830.39	-834.47	-281.27	840.40	6.45
126	11506.00	90.50	183.80	10829.87	-864.37	-283.58	870.35	5.21
127	11537.00	89.00	182.20	10830.01	-895.33	-285.20	901.34	7.07
128	11568.00	89.30	181.00	10830.47	-926.31	-286.06	932.33	3.99
129	11598.00	89.60	181.00	10830.75	-956.31	-286.59	962.33	1.00
130	11691.00	89.60	179.20	10831.40	-1049.30	-286.75	1055.30	1.94
131	11783.00	88.50	178.00	10832.93	-1141.26	-284.50	1147.19	1.77
132	11876.00	88.00	178.80	10835.77	-1234.17	-281.91	1240.03	1.01
133	11968.00	89.40	178.80	10837.86	-1326.13	-279.98	1331.92	1.52
134	12061.00	89.40	178.80	10838.83	-1419.10	-278.03	1424.83	0.00
135	12154.00	89.60	180.60	10839.64	-1512.09	-277.55	1517.79	1.95
136	12246.00	90.30	180.40	10839.72	-1604.09	-278.35	1609.78	0.79
137	12339.00	90.10	179.70	10839.40	-1697.09	-278.43	1702.76	0.78
138	12432.00	90.80	179.60	10838.67	-1790.08	-277.86	1795.72	0.76
139	12525.00	91.30	178.80	10836.96	-1883.06	-276.56	1888.64	1.01
140	12618.00	90.10	179.70	10835.83	-1976.04	-275.35	1981.58	1.61
141	12710.00	88.40	180.60	10837.03	-2068.03	-275.59	2073.55	2.09
142	12803.00	88.40	180.30	10839.63	-2160.99	-276.32	2166.50	0.32
143	12896.00	89.60	181.10	10841.25	-2253.97	-277.45	2259.48	1.55

SUNBURST CONSULTING, INC.

Operator:	Oasis Petroleum North America, LLC			Kick-off:	7/8/2013
Well :	Innoko 5301 41-12T			Finish:	7/20/2013
County:	McKenzie	State:	ND	Directional Supervision:	
QQ:	SW SE	Section:	12	Leam Drilling Systems	
Township:	153	N/S:	N		
Range:	101	E/W:	W	Date:	7/23/2013
Footages:	250	FN/SL:	S	Time:	11:11
	2410	FE/WL:	E	**F9 to re-calculate**	

Minimum Curvature Method (SPE-3362) Proposed dir: 181.25

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

No.	MD	INC	TRUE AZM	TVD	N-S	E-W	SECT	DLS/ 100
144	12990.00	90.00	180.60	10841.58	-2347.95	-278.85	2353.48	0.68
145	13085.00	91.50	180.30	10840.33	-2442.94	-279.59	2448.46	1.61
146	13180.00	90.00	181.10	10839.09	-2537.92	-280.75	2543.44	1.79
147	13275.00	88.50	180.30	10840.33	-2632.90	-281.92	2638.43	1.79
148	13370.00	90.70	180.00	10841.00	-2727.89	-282.16	2733.40	2.34
149	13465.00	87.70	181.30	10842.32	-2822.87	-283.24	2828.37	3.44
150	13591.00	88.50	181.50	10846.50	-2948.76	-286.32	2954.30	0.65
151	13654.00	89.00	180.40	10847.88	-3011.73	-287.36	3017.29	1.92
152	13749.00	89.50	180.80	10849.12	-3106.72	-288.36	3112.27	0.67
153	13844.00	90.30	180.10	10849.29	-3201.71	-289.10	3207.26	1.12
154	13938.00	89.70	181.10	10849.29	-3295.71	-290.09	3301.25	1.24
155	14033.00	88.90	181.80	10850.45	-3390.67	-292.49	3396.24	1.12
156	14128.00	88.80	181.10	10852.35	-3485.62	-294.89	3491.22	0.74
157	14223.00	88.80	181.30	10854.34	-3580.58	-296.88	3586.20	0.21
158	14318.00	90.00	180.60	10855.34	-3675.56	-298.46	3681.19	1.46
159	14413.00	88.00	180.60	10856.99	-3770.53	-299.45	3776.17	2.11
160	14508.00	89.40	179.90	10859.15	-3865.50	-299.87	3871.13	1.65
161	14602.00	87.10	180.80	10862.02	-3959.45	-300.44	3965.06	2.63
162	14697.00	87.10	180.80	10866.83	-4054.32	-301.77	4059.94	0.00
163	14792.00	86.90	180.40	10871.80	-4149.18	-302.76	4154.80	0.47
164	14887.00	89.70	179.70	10874.62	-4244.13	-302.84	4249.73	3.04
165	14981.00	90.30	179.70	10874.62	-4338.13	-302.35	4343.69	0.64
166	15076.00	91.10	180.10	10873.46	-4433.12	-302.18	4438.66	0.94
167	15171.00	90.40	180.40	10872.21	-4528.11	-302.60	4533.64	0.80
168	15265.00	90.70	180.60	10871.31	-4622.10	-303.42	4627.62	0.38
169	15360.00	90.80	179.40	10870.07	-4717.10	-303.42	4722.59	1.27
170	15455.00	92.50	180.40	10867.33	-4812.05	-303.25	4817.52	2.08
171	15550.00	90.90	179.90	10864.51	-4907.01	-303.50	4912.46	1.76
172	15645.00	91.00	178.80	10862.94	-5001.98	-302.42	5007.39	1.16
173	15739.00	90.30	178.80	10861.87	-5095.96	-300.45	5101.30	0.74
174	15834.00	90.40	179.00	10861.29	-5190.94	-298.63	5196.22	0.24
175	15929.00	90.30	178.50	10860.71	-5285.91	-296.56	5291.12	0.54
176	16024.00	89.40	178.80	10860.96	-5380.89	-294.32	5386.03	1.00
177	16119.00	90.80	178.50	10860.79	-5475.86	-292.08	5480.93	1.51
178	16213.00	91.40	179.00	10858.99	-5569.82	-290.03	5574.82	0.83
179	16308.00	92.20	179.40	10856.01	-5664.76	-288.71	5669.71	0.94

SUNBURST CONSULTING, INC.

Operator:	Oasis Petroleum North America, LLC			Kick-off:	7/8/2013
Well :	Innoko 5301 41-12T			Finish:	7/20/2013
County:	McKenzie	State:	ND	Directional Supervision:	
QQ:	SW SE	Section:	12	Leam Drilling Systems	
Township:	153	N/S:	N		
Range:	101	E/W:	W	Date:	7/23/2013
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Minimum Curvature Method (SPE-3362) Proposed dir: 181.25

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

No.	MD	INC	TRUE AZM	TVD	N-S	E-W	SECT	DLS/ 100
180	16403.00	91.20	179.20	10853.19	-5759.71	-287.55	5764.61	1.07
181	16498.00	91.80	179.70	10850.70	-5854.67	-286.63	5859.53	0.82
182	16593.00	90.10	178.10	10849.13	-5949.63	-284.81	5954.43	2.46
183	16688.00	90.00	178.80	10849.04	-6044.60	-282.24	6049.32	0.74
184	16783.00	91.90	178.30	10847.47	-6139.55	-279.84	6144.19	2.07
185	16877.00	90.60	177.10	10845.42	-6233.45	-276.07	6237.99	1.88
186	16972.00	91.50	176.40	10843.68	-6328.28	-270.68	6332.68	1.20
187	17067.00	91.30	176.90	10841.35	-6423.09	-265.13	6427.34	0.57
188	17162.00	90.90	178.10	10839.53	-6517.98	-260.99	6522.12	1.33
189	17257.00	91.60	180.10	10837.46	-6612.94	-259.50	6617.03	2.23
190	17281.00	92.40	177.30	10836.62	-6636.91	-258.95	6640.98	12.13
191	17375.00	91.20	177.30	10833.67	-6730.76	-254.53	6734.71	1.28
192	17470.00	90.70	179.60	10832.09	-6825.71	-251.96	6829.58	2.48
193	17565.00	90.80	181.30	10830.85	-6920.69	-252.70	6924.56	1.79
194	17660.00	90.10	181.50	10830.10	-7015.66	-255.03	7019.55	0.77
195	17755.00	90.70	181.70	10829.44	-7110.62	-257.68	7114.55	0.67
196	17849.00	91.10	180.80	10827.96	-7204.59	-259.73	7208.54	1.05
197	17944.00	90.10	181.80	10826.97	-7299.55	-261.88	7303.53	1.49
198	18039.00	90.30	181.50	10826.64	-7394.51	-264.62	7398.53	0.38
199	18134.00	90.20	181.50	10826.22	-7489.48	-267.11	7493.53	0.11
200	18228.00	90.20	181.50	10825.89	-7583.45	-269.57	7587.52	0.00
201	18323.00	91.30	181.50	10824.65	-7678.41	-272.05	7682.51	1.16
202	18418.00	92.30	181.10	10821.67	-7773.33	-274.21	7777.46	1.13
203	18513.00	90.50	181.80	10819.35	-7868.27	-276.61	7872.43	2.03
204	18608.00	90.10	181.80	10818.85	-7963.22	-279.59	7967.43	0.42
205	18702.00	90.10	181.80	10818.68	-8057.17	-282.55	8061.42	0.00
206	18797.00	93.20	183.20	10815.95	-8152.03	-286.69	8156.35	3.58
207	18892.00	91.70	182.40	10811.89	-8246.83	-291.32	8251.22	1.79
208	18987.00	91.10	181.70	10809.57	-8341.74	-294.72	8346.18	0.97
209	19082.00	89.60	181.10	10808.99	-8436.70	-297.04	8441.18	1.70
210	19177.00	90.60	180.80	10808.82	-8531.69	-298.62	8536.17	1.10
211	19271.00	91.50	181.70	10807.10	-8625.65	-300.67	8630.16	1.35
212	19366.00	89.10	178.30	10806.60	-8720.63	-300.67	8725.11	4.38
213	19461.00	88.60	178.70	10808.51	-8815.58	-298.18	8819.98	0.67
214	19555.00	89.80	179.40	10809.82	-8909.55	-296.62	8913.90	1.48
215	19650.00	90.70	179.60	10809.41	-9004.55	-295.79	9008.85	0.97

SUNBURST CONSULTING, INC.

Operator:	Oasis Petroleum North America, LLC			Kick-off:	7/8/2013
Well :	Innoko 5301 41-12T			Finish:	7/20/2013
County:	McKenzie	State:	ND	Directional Supervision:	
QQ:	SW SE	Section:	12	Leam Drilling Systems	
Township:	153	N/S:	N		
Range:	101	E/W:	W	Date:	7/23/2013
Footages:	250	FN/SL:	S	Time:	11:11
	2410	FE/WL:	E	**F9 to re-calculate**	

Minimum Curvature Method (SPE-3362) Proposed dir: 181.25

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

No.	MD	INC	TRUE AZM	TVD	N-S	E-W	SECT	DLS/ 100
216	19840.00	91.50	179.40	10805.76	-9194.50	-294.13	9198.73	0.43
217	19935.00	91.70	179.20	10803.11	-9289.46	-292.97	9293.64	0.30
218	20029.00	91.60	178.10	10800.40	-9383.39	-290.76	9387.50	1.17
219	20124.00	91.50	179.00	10797.83	-9478.32	-288.36	9482.36	0.95
220	20219.00	91.50	178.50	10795.34	-9573.27	-286.29	9577.24	0.53
221	20314.00	90.20	179.70	10793.93	-9668.24	-284.79	9672.15	1.86
222	20409.00	90.20	179.40	10793.60	-9763.24	-284.05	9767.11	0.32
223	20503.00	90.60	179.40	10792.94	-9857.23	-283.06	9861.06	0.43
224	20598.00	91.30	180.10	10791.37	-9952.22	-282.65	9956.01	1.04
225	20693.00	91.10	179.60	10789.38	-10047.20	-282.40	10050.96	0.57
226	20788.00	90.40	179.20	10788.14	-10142.18	-281.41	10145.91	0.85
227	20883.00	90.60	179.00	10787.31	-10237.17	-279.91	10240.84	0.30
228	20978.00	89.70	179.00	10787.06	-10332.15	-278.26	10335.76	0.95
229	21072.00	88.50	178.30	10788.54	-10426.11	-276.04	10429.65	1.48
230	21122.00	88.50	178.30	10789.84	-10476.07	-274.56	10479.57	0.00

FORMATION TOPS & STRUCTURAL RELATIONSHIPS

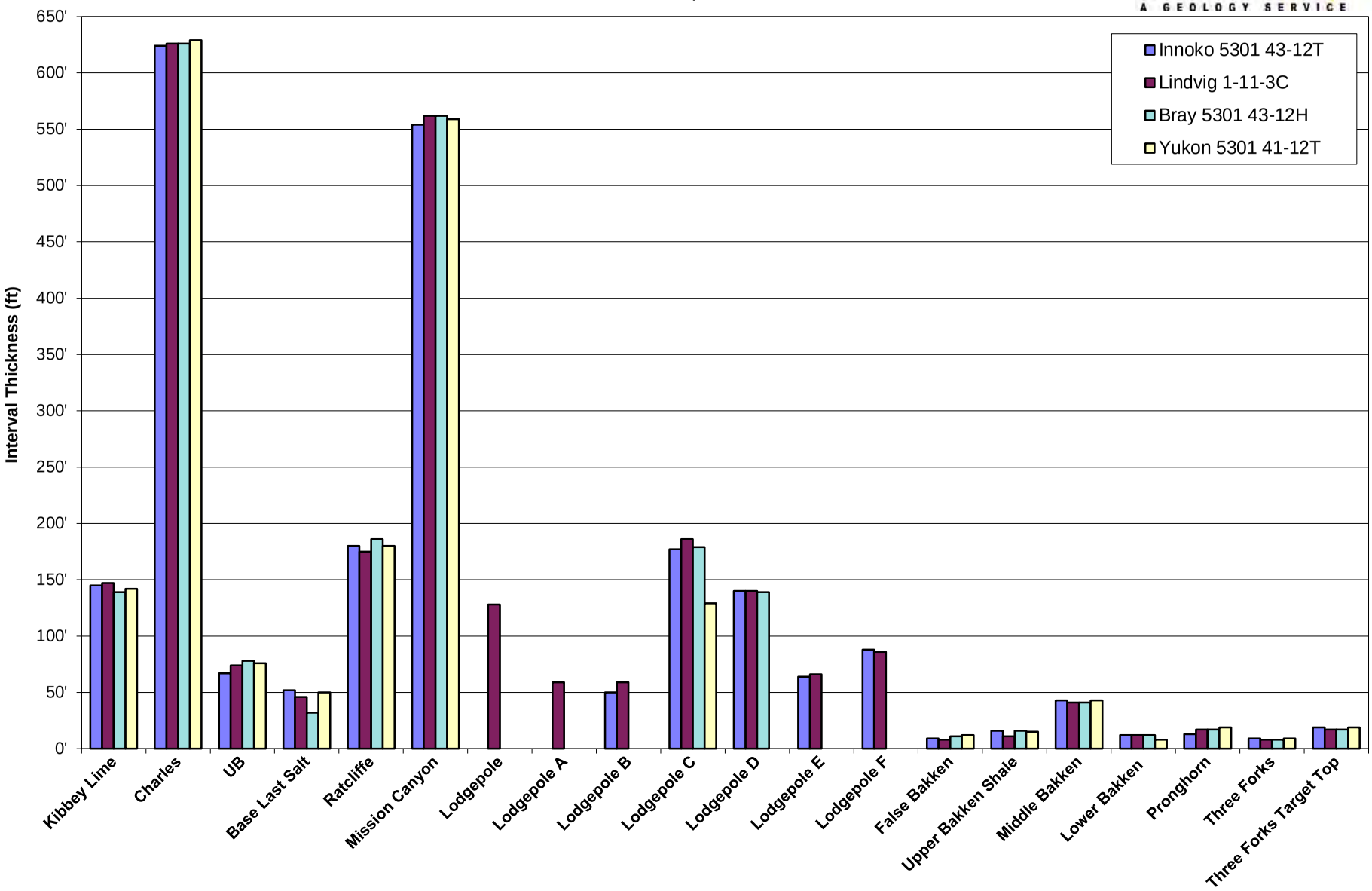
	Subject Well:								Offset Wells:		
Operator:	**Oasis Petroleum North America, LLC**										
Well Name:	**Innoko 5301 43-12T**										
Location:	250' FSL & 2,410' FEL										
	SW SE Section 12, T153N-R101W										
Elevation:	GL: 2,093' Sub: 25' KB: 2,118'										
Formation/ Zone	**Prog. Top**	**Prog. Datum (MSL)**	**Driller's Depth Top (MD)**	**Driller's Depth Top (TVD)**	**Datum (MSL)**	**Interval Thickness**	**Thickness to Target**	**Dip To Prog.**	**Dip To Lindvig 1-11-3C**	**Dip To Yukon 5301 41-12T**	**Dip To Bray 5301 43-12H**
Kibbey Lime	8,375'	-6,257'	8,391'	8,390'	-6,272'	145'	2,430'	-15'	-18'	-26'	-8'
Charles	8,522'	-6,404'	8,536'	8,535'	-6,417'	624'	2,285'	-13'	-16'	-29'	-14'
UB	9,148'	-7,030'	9,160'	9,159'	-7,041'	67'	1,661'	-11'	-14'	-	-12'
Base Last Salt	9,224'	-7,106'	9,227'	9,226'	-7,108'	52'	1,594'	-2'	-7'	-15'	-1'
Ratcliffe	9,268'	-7,150'	9,278'	9,278'	-7,160'	180'	1,542'	-10'	-13'	-	-21'
Mission Canyon	9,443'	-7,325'	9,459'	9,458'	-7,340'	554'	1,362'	-15'	-18'	-17'	-15'
Lodgepole	10,009'	-7,891'	10,013'	10,012'	-7,894'	-	808'	-3'	-10'	-12'	-7'
Lodgepole A	-	-	-	-	-	-	-	-	-	-	-
Lodgepole B	10,194'	-8,076'	10,200'	10,199'	-8,081'	50'	621'	-5'	-10'	-	-
Lodgepole C	-	-	10,250'	10,249'	-8,131'	177'	571'	-	-15'	158'	-6'
Lodgepole D	-	-	10,430'	10,426'	-8,308'	140'	394'	-	-6'	110'	-4'
Lodgepole E	-	-	10,586'	10,566'	-8,448'	64'	254'	-	-6'	-	-5'
Lodgepole F	-	-	10,663'	10,630'	-8,512'	88'	190'	-	-4'	24'	-
False Bakken	10,717'	-8,599'	10,782'	10,718'	-8,600'	9'	102'	-1'	-6'	-22'	1'
Upper Bakken	10,726'	-8,608'	10,795'	10,727'	-8,609'	16'	93'	-1'	-7'	-19'	3'
Middle Bakken	10,736'	-8,618'	10,823'	10,743'	-8,625'	43'	77'	-7'	-12'	-20'	3'
Lower Bakken	10,777'	-8,659'	10,908'	10,786'	-8,668'	12'	34'	-9'	-14'	-20'	1'
Pronghorn	10,790'	-8,672'	10,936'	10,798'	-8,680'	13'	22'	-8'	-14'	-24'	1'
Three Forks	10,806'	-8,688'	10,972'	10,811'	-8,693'	9'	9'	-5'	-10'	-18'	5'
Three Forks Target Top	10,814'	-8,696'	10,997'	10,820'	-8,702'	19'	0'	-6'	-11'	-18'	4'
Three Forks Target	10,832'	-8,714'	11,141'	10,839'	-8,721'	-	-	-7'	-13'	-18'	2'

CONTROL DATA

Operator:	Gulf Oil				Oasis Petroleum North America, LLC				Oasis Petroleum North America, LLC			
Well Name:	Lindvig 1-11-3C				Yukon 5301 41-12T				Bray 5301 43-12H			
Location:	NW NW Sec. 11, T152N, R101W McKenzie Co., ND 0.71 miles NW of Innoko 5301 43-12T				SWSW Sec. 12, T153N, R101W McKenzie Co., ND 0.40 miles W of Innoko 5301 43-12T				SW SE Sec. 12, T153N, R101W McKenzie Co., ND 0.90 miles E of Innoko 5301 43-12T			
Elevation:	KB: 2,108'				KB: 2,119'				KB: 2,091'			
Formation/ Zone	**E-Log Top**	**Datum (MSL)**	**Interval Thickness**	**Thickness to Target**	**E-Log Top**	**Datum (MSL)**	**Interval Thickness**	**Thickness to Target**	**E-Log Top**	**Datum (MSL)**	**Interval Thickness**	**Thickness to Target**
Kibbey Lime	8,362'	-6,254'	147'	2,437'	8,365'	-6,246'	142'	2,438'	8,355'	-6,264'	139'	2,442'
Charles	8,509'	-6,401'	626'	2,290'	8,507'	-6,388'	629'	2,296'	8,494'	-6,403'	626'	2,303'
UB	9,135'	-7,027'	74'	1,664'	9,136'	-7,017'	76'	-	9,120'	-7,029'	78'	1,677'
Base Last Salt	9,209'	-7,101'	46'	1,590'	9,212'	-7,093'	50'	1,591'	9,198'	-7,107'	32'	1,599'
Ratcliffe	9,255'	-7,147'	175'	1,544'	9,262'	-7,143'	180'	-	9,230'	-7,139'	186'	1,567'
Mission Canyon	9,430'	-7,322'	562'	1,369'	9,442'	-7,323'	559'	1,361'	9,416'	-7,325'	562'	1,381'
Lodgepole	9,992'	-7,884'	128'	807'	10,001'	-7,882'	-	802'	9,978'	-7,887'	-	819'
Lodgepole A	10,120'	-8,012'	59'	679'	-	-	-	-	-	-	-	-
Lodgepole B	10,179'	-8,071'	59'	620'	-	-	-	-	-	-	-	-
Lodgepole C	10,224'	-8,116'	186'	575'	10,408'	-8,289'	129'	395'	10,216'	-8,125'	179'	581'
Lodgepole D	10,410'	-8,302'	140'	389'	10,537'	-8,418'	-	266'	10,395'	-8,304'	139'	402'
Lodgepole E	10,550'	-8,442'	66'	249'	-	-	-	-	10,534'	-8,443'	-	263'
Lodgepole F	10,616'	-8,508'	86'	183'	10,655'	-8,536'	-	148'	-	-	-	-
False Bakken	10,702'	-8,594'	8'	97'	10,697'	-8,578'	12'	106'	10,692'	-8,601'	11'	105'
Upper Bakken Shale	10,710'	-8,602'	11'	89'	10,709'	-8,590'	15'	94'	10,703'	-8,612'	16'	94'
Middle Bakken	10,721'	-8,613'	41'	78'	10,724'	-8,605'	43'	79'	10,719'	-8,628'	41'	78'
Lower Bakken	10,762'	-8,654'	12'	37'	10,767'	-8,648'	8'	36'	10,760'	-8,669'	12'	37'
Pronghorn	10,774'	-8,666'	17'	25'	10,775'	-8,656'	19'	28'	10,772'	-8,681'	17'	25'
Three Forks	10,791'	-8,683'	8'	8'	10,794'	-8,675'	9'	9'	10,789'	-8,698'	8'	8'
Three Forks Target Top	10,799'	-8,691'	17'	0'	10803	-8,684'	19	0'	10,797'	-8,706'	17'	0'
Three Forks Target Base	10,816'	-8,708'	3'	-	10822	-8,703'	2	-	10,814'	-8,723'	3'	-
Claystone	10,819'	-8,711'	-	-	10824	-8,705'	-	-	10,817'	-8,726'	-	-

INTERVAL THICKNESS

Oasis Petroleum North America, LLC - Innoko 5301 43-12T

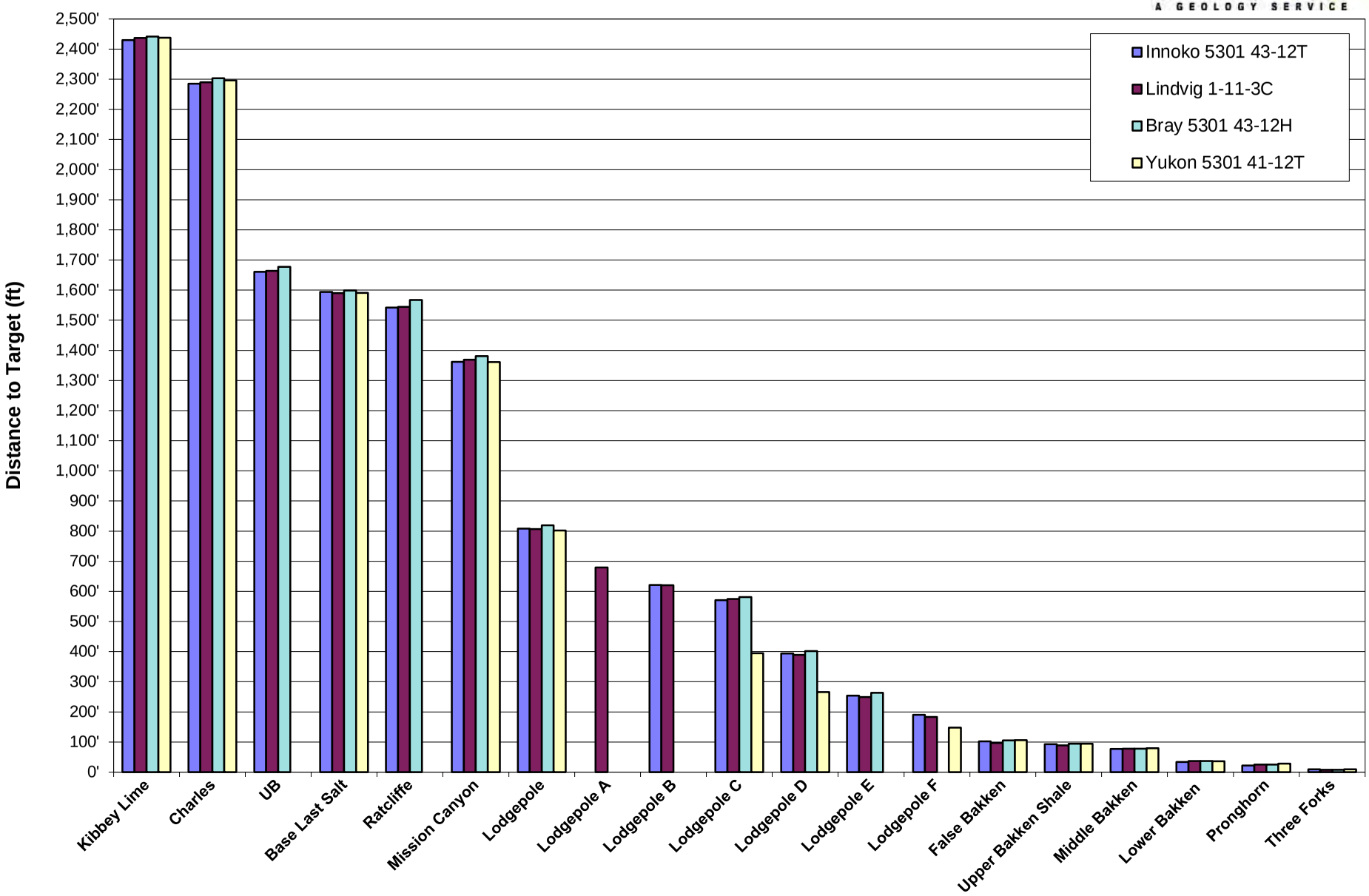


LANDING PROJECTION

Formation/ Zone:	Proposed Top of Target From:			
	Lindvig 1-11-3C	Yukon 5301 41-12T	Bray 5301 43-12H	Average of Offset Wells
Kibbey Lime	10,827'	10,828'	10,832'	10,829'
Charles	10,825'	10,831'	10,838'	10,831'
UB	10,823'	-	10,836'	10,830'
Base Last Salt	10,816'	10,817'	10,825'	10,819'
Ratcliffe	10,822'	-	10,845'	10,834'
Mission Canyon	10,827'	10,819'	10,839'	10,828'
Lodgepole	10,819'	10,814'	10,831'	10,821'
Lodgepole A	-	-	-	-
Lodgepole B	10,819'	-	-	10,819'
Lodgepole C	10,824'	10,644'	10,830'	10,766'
Lodgepole D	10,815'	10,692'	10,828'	10,778'
Lodgepole E	10,815'	-	10,829'	10,822'
Lodgepole F	10,813'	10,778'	-	10,796'
False Bakken	10,815'	10,824'	10,823'	10,821'
Upper Bakken Shale	10,816'	10,821'	10,821'	10,819'
Middle Bakken	10,821'	10,822'	10,821'	10,821'
Lower Bakken	10,823'	10,822'	10,823'	10,823'
Pronghorn	10,823'	10,826'	10,823'	10,824'
Three Forks	10,819'	10,820'	10,819'	10,819'
Three Forks Target Top	10,820'	10,820'	10,820'	10,820'

ISOPACH TO TARGET

Oasis Petroleum North America, LLC - Innoko 5301 43-12T



LITHOLOGY

Rig crews caught lagged samples in 30' intervals under the supervision of Sunburst geologists. A detailed list of sampling intervals is included in the well data summary page. Sample or gamma ray marker tops have been inserted in the sample descriptions below for reference. Samples were examined wet and dry under a trinocular microscope. The drilling fluid was diesel-based invert from surface casing to intermediate casing, while salt water drilling fluid was used throughout the lateral. Sample collection began at 8,300'.

Drilling in the Kibbey Formation

8270-8300 SILTSTONE: dark orange to light brown, tan to light pink, soft, sub-blocky, calcite cement, poorly cemented; rare ANHYDRITE: off white, soft, amorphous texture; trace SILTY SANDSTONE: tan to off white, very fine grained, sub-rounded, moderately sorted, calcite cement, poorly cemented

8300-8330 SILTSTONE: dark orange to light brown, tan to light pink, soft, sub-blocky, calcite cement, poorly cemented; rare ANHYDRITE: off white, soft, amorphous texture; trace SILTY SANDSTONE: tan to off white, very fine grained, sub-rounded, moderately sorted, calcite cement, poorly cemented

8330-8360 SILTSTONE: dark orange to light brown, tan to light pink, soft, sub-blocky, calcite cement, poorly cemented; rare ANHYDRITE: off white, soft, amorphous texture; trace SILTY SANDSTONE: as above

8360-8390 SILTSTONE: dark orange to light brown, tan to light pink, soft, sub-blocky, calcite cement, poorly cemented; rare ANHYDRITE: off white, soft, amorphous texture; trace SILTY SANDSTONE: as above

Kibbey "Lime" [8,391' MD, 8,390' TVD (-6,272')]

8390-8420 SILTSTONE: dark orange to light brown, tan to light pink, soft, sub-blocky, calcite cement, poorly cemented; rare ANHYDRITE: off white, soft, amorphous texture; trace SILTY SANDSTONE: as above; ARGILLACEOUS LIMESTONE: mudstone, gray to gray-brown, microcrystalline, firm to hard, dense, chalky texture, no visible porosity

8420-8450 SILTSTONE: dark orange to light brown, tan to light pink, soft, sub-blocky, calcite cement, poorly cemented; rare ANHYDRITE: off white, soft, amorphous texture; trace SILTY SANDSTONE: as above; ARGILLACEOUS LIMESTONE: mudstone, gray to gray-brown, microcrystalline, firm to hard, dense, chalky texture, no visible porosity

8450-8480 SILTSTONE: dark orange to light brown, red to red-brown, occasional tan to light pink, soft, sub-blocky, calcite cement, poorly cemented, sandy in part; rare ANHYDRITE: as above; trace ARGILLACEOUS LIMESTONE: as above

8480-8510 SILTSTONE: dark orange to light brown, red to red-brown, occasional tan to light pink, soft, sub-blocky, calcite cement, poorly cemented, sandy in part; rare ANHYDRITE: as above; trace ARGILLACEOUS LIMESTONE: as above

8510-8540 SILTSTONE: dark orange to light brown, red to red-brown, occasional tan to light pink, soft, sub-blocky, calcite cement, poorly cemented, sandy in part; rare ANHYDRITE: as above; trace ARGILLACEOUS LIMESTONE: as above

Charles Formation: 1st Salt [8,536' MD, 8,535' TVD (-6,417')]

8540-8570 SALT: translucent, anhedral, crystalline texture, hard, frosted; occasional SILTSTONE: dark orange to light brown, red to red-brown, occasional tan, soft, sub-blocky, calcite cement, poorly cemented, sandy in part

8570-8600 SALT: translucent, anhedral, crystalline texture, hard, frosted

8600-8630 SALT: translucent, anhedral, crystalline texture, hard, frosted

8630-8660 SALT: translucent, anhedral, crystalline texture, hard, frosted

8660-8690 SALT: translucent, anhedral, crystalline texture, hard, frosted; rare LIMESTONE: mudstone, cream, tan, light gray, microcrystalline, firm, dense, earthy texture, no visible porosity

8690-8720 SALT: translucent, anhedral, crystalline texture, hard, frosted; rare LIMESTONE: mudstone, cream, tan, light gray, microcrystalline, firm, dense, earthy texture, no visible porosity

8720-8750 SALT: translucent, anhedral, crystalline texture, hard, frosted; rare LIMESTONE: mudstone, cream, tan, light gray, microcrystalline, firm, dense, earthy texture, no visible porosity; rare ANHYDRITE: off white, soft, amorphous

8750-8780 SALT: translucent, anhedral, crystalline texture, hard, frosted; rare LIMESTONE: mudstone, cream, tan, light gray, microcrystalline, firm, dense, earthy texture, no visible porosity; rare ANHYDRITE: off white, soft, amorphous

8780-8810 ANHYDRITE: off white, soft, amorphous; common SALT: clear to milky, off white, crystalline, hard, euhedral; trace SILTSTONE: as above

8810-8840 ANHYDRITE: off white, soft, amorphous; common SALT: clear to milky, off white, crystalline, hard, euhedral; trace SILTSTONE: as above

8840-8870 ARGILLACEOUS LIMESTONE: mudstone, cream, tan, light gray, microcrystalline, firm, dense, earthy texture, no visible porosity, occasional ANHYDRITE: off white, soft, amorphous; trace SALT: as above

8870-8900 ARGILLACEOUS LIMESTONE: mudstone, cream, tan, light gray, microcrystalline, firm, dense, earthy texture, no visible porosity, occasional ANHYDRITE: off white, soft, amorphous

8900-8930 ARGILLACEOUS LIMESTONE: mudstone, cream, tan, light gray, microcrystalline, firm, dense, earthy texture, no visible porosity, occasional ANHYDRITE: off white, soft, amorphous

8930-8960 ARGILLACEOUS LIMESTONE: mudstone, cream, tan, light gray, microcrystalline, firm, dense, earthy texture, no visible porosity, occasional SALT: clear to milky, off white, crystalline, hard, euhedral; trace ANHYDRITE: as above

8960-8990 ARGILLACEOUS LIMESTONE: mudstone, cream, tan, light gray, microcrystalline, firm, dense, earthy texture, no visible porosity, occasional SALT: clear to milky, off white, crystalline, hard, euhedral; trace ANHYDRITE: as above

8990-9020 ARGILLACEOUS LIMESTONE: mudstone, cream, tan, light gray, microcrystalline, firm, dense, earthy texture, no visible porosity, occasional SALT: clear to milky, off white, crystalline, hard, euhedral; trace ANHYDRITE: as above, slow weak streaming pale ya cut fluorescence

9020-9050 SALT: clear to milky, off white, crystalline, hard, euhedral; rare ARGILLACEOUS LIMESTONE: mudstone, cream, light gray, microcrystalline, firm, dense, earthy texture, no visible porosity; trace ANHYDRITE: off white, soft, amorphous

9050-9080 ARGILLACEOUS LIMESTONE: mudstone, cream, tan, light gray, microcrystalline, firm, dense, earthy texture, no visible porosity, occasional SALT: clear to milky, off white, crystalline, hard, euhedral; trace ANHYDRITE: as above

9080-9110 LIMESTONE: mudstone, light to medium gray-brown, tan, microcrystalline, firm to friable, rare algal matting; rare ANHYDRITE: off white, massive, soft, amorphous

9110-9140 LIMESTONE: mudstone, light to medium gray-brown, tan, microcrystalline, firm to friable, rare algal matting; rare ANHYDRITE: off white, massive, soft, amorphous

UB [9,160’ MD, 9,159’ TVD (-7,041’)]

9140-9170 LIMESTONE: mudstone, light to medium gray-brown, tan, microcrystalline, firm to friable, rare algal matting; common ANHYDRITE: off white, massive, soft, amorphous

9170-9200 LIMESTONE: mudstone, light to medium gray-brown, tan, microcrystalline, firm to friable, rare algal matting; common ANHYDRITE: off white, massive, soft, amorphous

9200-9230 LIMESTONE: mudstone, light to medium gray-brown, tan, massive, microcrystalline, firm to friable, rare algal matting; rare ANHYDRITE: as above; rare SALT: translucent to milky white, crystalline, hard, euhedral

Base Last Salt [9,227' MD, 9,226' TVD (-7,207')]

9230-9260 LIMESTONE: mudstone, light to medium gray-brown, tan, massive, microcrystalline, firm to friable, rare algal matting; rare ANHYDRITE: as above; rare SALT: translucent to milky white, crystalline, hard, euhedral

Ratcliffe [9,279' MD, 9,278' TVD (-7,160')]

9260-9290 LIMESTONE: mudstone, light to medium gray-brown, tan, massive, microcrystalline, firm to friable, rare algal matting; rare ANHYDRITE: as above; rare SALT: translucent to milky white, crystalline, hard, euhedral

9290-9320 LIMESTONE: mudstone, light to medium gray-brown, tan, massive, microcrystalline, firm to friable, rare algal matting; rare ANHYDRITE: as above

9320-9350 LIMESTONE: mudstone, light to medium gray-brown, tan, massive, microcrystalline, firm to friable, rare algal matting; rare ANHYDRITE: as above

9350-9380 LIMESTONE: mudstone, light to medium gray-brown, tan, massive, microcrystalline, firm to friable, rare Algal matting; rare ANHYDRITE: off white, massive, soft, amorphous

9380-9410 LIMESTONE: mudstone, light to medium gray-brown, tan, massive, microcrystalline, firm to friable, rare Algal matting; rare ANHYDRITE: off white, massive, soft, amorphous

9410-9440 LIMESTONE: mudstone, light to medium gray-brown, tan, massive, microcrystalline, firm to friable, rare Algal matting; rare ANHYDRITE: off white, massive, soft, amorphous

Mission Canyon Formation [9,459' MD, 9,458' TVD (-7,340')]

9440-9470 LIMESTONE: mudstone, light to medium gray-brown, tan, massive, microcrystalline, firm to friable, rare algal matting; rare ANHYDRITE: off white, massive, soft, amorphous

9470-9500 LIMESTONE: mudstone, light to medium gray-brown, tan, massive, microcrystalline, firm to friable, rare algal matting; rare ANHYDRITE: off white, massive, soft, amorphous

9500-9530 LIMESTONE: mudstone, light to medium gray-brown, tan, massive, microcrystalline, firm to friable, rare algal matting; rare ANHYDRITE: off white, massive, soft, amorphous

9530-9560 LIMESTONE: mudstone, light to medium gray-brown, tan, massive, microcrystalline, firm to friable, rare algal matting; rare ANHYDRITE: off white, massive, soft, amorphous

9560-9590 LIMESTONE: mudstone, light to medium gray-brown, tan, massive, microcrystalline, firm to friable, rare algal matting; rare ANHYDRITE: off white, massive, soft, amorphous

9590-9620 LIMESTONE: mudstone, light to medium gray-brown, tan, massive, microcrystalline, firm to friable, rare algal matting; rare ANHYDRITE: off white, massive, soft, amorphous

9620-9650 LIMESTONE: mudstone, light to medium gray-brown, tan, massive, microcrystalline, firm to friable, rare algal matting; rare ANHYDRITE: off white, massive, soft, amorphous

9650-9680 LIMESTONE: mudstone, light to medium gray-brown, tan, massive, microcrystalline, firm to friable, rare algal matting; rare ANHYDRITE: off white, massive, soft, amorphous

9680-9710 LIMESTONE: mudstone, light to medium gray-brown, tan, massive, microcrystalline, firm to friable, rare algal matting; rare ANHYDRITE: off white, massive, soft, amorphous

9710-9740 ARGILLACEOUS LIMESTONE: mudstone to wackestone, light to medium brown gray, common cream to tan, microcrystalline, firm to hard, algal structure, trace disseminated pyrite, no visible porosity

9740-9770 ARGILLACEOUS LIMESTONE: mudstone to wackestone, light to medium brown gray, common cream to tan, microcrystalline, firm to hard, algal structure, trace disseminated pyrite, no visible porosity

9770-9800 ARGILLACEOUS LIMESTONE: mudstone to wackestone, light to medium brown gray, common cream to tan, microcrystalline, firm to hard, algal structure, trace disseminated pyrite, no visible porosity

9800-9830 ARGILLACEOUS LIMESTONE: mudstone to wackestone, light to medium brown gray, common cream to tan, microcrystalline, firm to hard, algal structure, trace disseminated pyrite, no visible porosity

9830-9860 ARGILLACEOUS LIMESTONE: mudstone to wackestone, light to medium brown gray, common cream to tan, microcrystalline, firm to hard, algal structure, trace disseminated pyrite, no visible porosity

9860-9890 ARGILLACEOUS LIMESTONE: mudstone to wackestone, light to medium brown gray, common cream to tan, microcrystalline, firm to hard, algal structure, trace disseminated pyrite, no visible porosity

9890-9920 ARGILLACEOUS LIMESTONE: mudstone to wackestone, light to medium brown gray, common cream to tan, microcrystalline, firm to hard, algal structure, trace disseminated pyrite, no visible porosity

9920-9950 ARGILLACEOUS LIMESTONE: mudstone to wackestone, light to medium brown gray, common cream to tan, microcrystalline, firm to hard, algal structure, trace disseminated pyrite, no visible porosity, very slow weak diffuse pale green cut fluorescence

9950-9980 ARGILLACEOUS LIMESTONE: mudstone to wackestone, light to medium brown gray, common cream to tan, microcrystalline, firm to hard, algal structure, trace disseminated pyrite, no visible porosity, very slow weak diffuse pale green cut fluorescence

9980-10010 ARGILLACEOUS LIMESTONE: mudstone to wackestone, light to medium brown gray, common cream to tan, microcrystalline, firm to hard, algal structure, trace disseminated pyrite, no visible porosity

Lodgepole Formation [10,013’ MD, 10,012’ TVD (-7,894’)]

10010-10040 ARGILLACEOUS LIMESTONE: mudstone, gray to dark gray, occasional off white, microcrystalline, firm, dense, earthy texture, no visible porosity

10040-10070 ARGILLACEOUS LIMESTONE: mudstone, gray to dark gray, occasional off white, microcrystalline, firm, dense, earthy texture, no visible porosity

10070-10100 ARGILLACEOUS LIMESTONE: mudstone, gray to dark gray, occasional off white, microcrystalline, firm, dense, earthy texture, no visible porosity

10100-10130 ARGILLACEOUS LIMESTONE: mudstone, gray to medium gray, dark gray, trace off white, microcrystalline, firm, dense, earthy texture, trace disseminated pyrite, no visible porosity

10130-10160 ARGILLACEOUS LIMESTONE: mudstone, gray to medium gray, dark gray, trace off white, microcrystalline, firm, dense, earthy texture, trace disseminated pyrite, no visible porosity

10160-10190 ARGILLACEOUS LIMESTONE: mudstone, gray to medium gray, dark gray, trace off white, microcrystalline, firm, dense, earthy texture, trace disseminated pyrite, no visible porosity

10190-10220 ARGILLACEOUS LIMESTONE: mudstone, gray to medium gray, dark gray, trace off white, microcrystalline, firm, dense, earthy texture, trace disseminated pyrite, no visible porosity, very slow weak cloudy pale green cut fluorescence

10220-10250 ARGILLACEOUS LIMESTONE: mudstone, gray to medium gray, dark gray, trace off white, microcrystalline, firm, dense, earthy texture, trace disseminated pyrite, no visible porosity, slow weak cloudy pale green cut fluorescence

10250-10280 ARGILLACEOUS LIMESTONE: mudstone, gray to medium gray, dark gray, trace off white, microcrystalline, firm, dense, earthy texture, trace disseminated pyrite, no visible porosity, slow weak cloudy pale green cut fluorescence

10280-10300 ARGILLACEOUS LIMESTONE: mudstone, gray to medium gray, dark gray, trace off white, microcrystalline, firm, dense, earthy texture, trace disseminated pyrite, no visible porosity, very slow cloudy pale green cut fluorescence

10310-10340 ARGILLACEOUS LIMESTONE: mudstone, gray to medium gray, dark gray, trace off white, microcrystalline, firm, dense, earthy texture, trace disseminated pyrite, no visible porosity

10340-10370 ARGILLACEOUS LIMESTONE: mudstone, gray to medium gray, dark gray, trace off white, microcrystalline, firm, dense, earthy texture, trace disseminated pyrite, no visible porosity

10370-10400 ARGILLACEOUS LIMESTONE: mudstone, gray to medium gray, dark gray, trace off white, microcrystalline, firm, dense, earthy texture, trace disseminated pyrite, no visible porosity

10400-10430 ARGILLACEOUS LIMESTONE: mudstone, gray to medium gray, dark gray, trace off white, microcrystalline, firm, dense, earthy texture, trace disseminated pyrite, no visible porosity

10430-10460 ARGILLACEOUS LIMESTONE: mudstone, gray to medium gray, dark gray, trace off white, microcrystalline, firm, dense, earthy texture, trace disseminated pyrite, no visible porosity

10460-10490 ARGILLACEOUS LIMESTONE: mudstone, medium to dark gray-brown, occasional light gray to tan, very fine crystalline, firm to friable, earthy, microcrystalline, dense, trace disseminated pyrite, no visible porosity

10490-10520 ARGILLACEOUS LIMESTONE: mudstone, medium to dark gray-brown, occasional light gray to tan, very fine crystalline, firm to friable, earthy, microcrystalline, dense, trace disseminated pyrite, no visible porosity

10520-10550 ARGILLACEOUS LIMESTONE: mudstone, medium to dark gray-brown, occasional light gray to tan, very fine crystalline, firm to friable, earthy, microcrystalline, dense, trace disseminated pyrite, no visible porosity

10550-10580 ARGILLACEOUS LIMESTONE: mudstone, medium to dark gray-brown, occasional light gray to tan, very fine crystalline, firm to friable, earthy, microcrystalline, dense, trace disseminated pyrite, no visible porosity

10580-10610 ARGILLACEOUS LIMESTONE: mudstone, medium to dark gray-brown, occasional light gray to tan, very fine crystalline, firm to friable, earthy, microcrystalline, dense, trace disseminated pyrite, no visible porosity

10610-10640 ARGILLACEOUS LIMESTONE: mudstone, medium to dark gray-brown, occasional light gray to tan, very fine crystalline, firm to friable, earthy, microcrystalline, dense, trace disseminated pyrite, no visible porosity

10640-10670 ARGILLACEOUS LIMESTONE: mudstone, medium to dark gray-brown, occasional light gray to tan, very fine crystalline, firm to friable, earthy, microcrystalline, dense, trace disseminated pyrite, no visible porosity

10670-10700 ARGILLACEOUS LIMESTONE: mudstone, medium to dark gray-brown, occasional light gray to tan, very fine crystalline, firm to friable, earthy, microcrystalline, dense, trace disseminated pyrite, no visible porosity

10700-10730 ARGILLACEOUS LIMESTONE: mudstone, medium to dark gray-brown, occasional light gray to tan, very fine crystalline, firm to friable, earthy, microcrystalline, dense, trace disseminated pyrite, no visible porosity

10730-10760 ARGILLACEOUS LIMESTONE: mudstone, medium to dark gray-brown, occasional light gray to tan, very fine crystalline, firm to friable, earthy, microcrystalline, dense, trace disseminated pyrite, no visible porosity

False Bakken [10,782' MD, 10,718' TVD (-8,600')]

10760-10790 ARGILLACEOUS LIMESTONE: mudstone, medium to dark gray-brown, occasional light gray to tan, very fine crystalline, firm to friable, earthy, microcrystalline, dense, banded, trace disseminated pyrite, no visible porosity

Bakken Formation: Upper Bakken Shale [10,797' MD, 10,727' TVD (-8,609')]

10790-10820 ARGILLACEOUS LIMESTONE: mudstone, medium to dark gray, common light gray to tan, trace off white, microcrystalline, firm to hard, dense, earthy texture, rare disseminated pyrite, no visible porosity; occasional SHALE: very dark brown, trace black, soft to firm, blocky, earthy texture, trace disseminated pyrite

Middle Bakken [10,823' MD, 10,743' TVD (-8,625')]

10820-10850 SHALE: black to very dark brown, firm, blocky, earthy texture, disseminated pyrite, petroliferous, carbonaceous; SILTSTONE: light gray to light gray-brown, sub-blocky, calcite cemented, trace disseminated pyrite, possible intergranular porosity

10860-10870 SILTSTONE: light gray to light gray-brown, sub-blocky, calcite cemented, trace disseminated pyrite, possible intergranular porosity; rare SHALE: black to very dark brown, firm, blocky, earthy texture, disseminated pyrite, petroliferous, carbonaceous

10850-10860 SHALE: black to very dark brown, firm, blocky, earthy texture, disseminated pyrite, petroliferous, carbonaceous; trace SILTSTONE: light gray, light gray-brown, sub-blocky, calcite cemented, trace disseminated pyrite, possible intergranular porosity

10870-10880 SILTSTONE: light gray to light gray-brown, sub-blocky, calcite cemented, trace disseminated pyrite, possible intergranular porosity; rare SHALE: as above

10880-10890 SILTSTONE: as above; occasional SILTY SANDSTONE: medium to light gray, gray to brown, fine grained, sub-rounded, firm, moderately sorted, calcite cement, moderately cemented, trace disseminated pyrite, possible intergranular porosity, trace spotty light brown oil stain

10890-10900 SILTSTONE: light gray to light gray-brown, sub-blocky, calcite cemented, trace disseminated pyrite, possible intergranular porosity; rare SHALE: as above; SILTY SANDSTONE: as above

10900-10910 SILTSTONE: light gray to light gray-brown, sub-blocky, calcite cemented, trace disseminated pyrite, possible intergranular porosity; rare SHALE: black to very dark brown, firm, blocky, earthy texture, trace disseminated pyrite, petroliferous, carbonaceous; SILTY SANDSTONE: as above

Lower Bakken Shale [10,908' MD, 10,786' TVD (-8,668')]

10910-10920 SILTSTONE: light gray to light gray-brown, sub-blocky, calcite cemented, trace disseminated pyrite, possible intergranular porosity; rare SHALE: black to very dark brown, firm, blocky, earthy texture, rare disseminated pyrite, petroliferous, carbonaceous; SILTY SANDSTONE: as above

10920-10930 SILTY SANDSTONE: medium to light gray, gray to brown, fine grained, sub-rounded, firm, moderately sorted, calcite cement, moderately cemented, trace disseminated pyrite, possible intergranular porosity, trace spotty light brown oil stain; occasional SHALE: black to dark brown, firm to hard, blocky, earthy texture, carbonaceous, rare disseminated pyrite

Pronghorn [10,936' MD, 10,798' TVD (-8,680')]

10930-10940 SHALE: black to dark brown, firm to hard, blocky, earthy texture, carbonaceous, abundant disseminated pyrite

10940-10950 SHALE: black to dark brown, firm to hard, blocky, earthy texture, carbonaceous, rare disseminated pyrite

10950-10960 SILTSTONE: dark to medium brown gray, sub-blocky to sub-rounded, soft, well sorted, calcite cement, moderately cemented, visible intergranular porosity, trace spotty light brown oil stain; trace SHALE: black to dark brown, firm to hard, blocky, earthy texture, carbonaceous, rare disseminated pyrite

10960-10970 SILTSTONE: dark to medium brown gray, sub-blocky to sub-rounded, soft, well sorted, calcite cement, moderately cemented, visible intergranular porosity, trace spotty light brown oil stain; trace SHALE: black to dark brown, firm to hard, blocky, earthy texture, carbonaceous, rare disseminated pyrite

Three Forks Formation [10,972'MD, 10,811' TVD (-8,693')]

10970-10980 SILTSTONE: dark to medium brown gray, sub-blocky to sub-rounded, soft, well sorted, calcite cement, moderately cemented, visible intergranular porosity, trace spotty light brown oil stain; trace SHALE: black to dark brown, firm to hard, blocky, earthy texture, carbonaceous, rare disseminated pyrite

10980-10990 SILTSTONE: as above; ARGILLACEOUS DOLOMITE: mudstone, medium gray to gray-brown, pale green, cream to tan, fine crystalline, sucrosic texture, firm to friable, rare disseminated pyrite, silty in part, sandy in part, possible intercrystalline porosity, trace spotty light brown oil stain

10990-11000 ARGILLACEOUS DOLOMITE: mudstone, medium gray to gray-brown, pale green, cream to tan, fine crystalline, sucrosic texture, firm to friable, rare disseminated pyrite, silty in part, sandy in part, possible intercrystalline porosity, trace spotty light brown oil stain

11000-11010 ARGILLACEOUS DOLOMITE: mudstone, medium gray to gray-brown, pale green, cream to tan, fine crystalline, sucrosic texture, firm to friable, rare disseminated pyrite, silty in part, sandy in part, possible intercrystalline porosity, trace spotty light brown oil stain

11010-11020 ARGILLACEOUS DOLOMITE: mudstone, medium gray to gray-brown, pale green, cream to tan, fine crystalline, sucrosic texture, firm to friable, rare disseminated pyrite, silty in part, sandy in part, possible intercrystalline porosity, trace spotty light brown oil stain; common SHALE: light green, trace gray, friable, earthy texture, trace disseminated pyrite, no visible porosity, trace spotty light brown oil stain

11030-11040 ARGILLACEOUS DOLOMITE: mudstone, medium gray to gray-brown, pale green, cream to tan, fine crystalline, sucrosic texture, firm to friable, rare disseminated pyrite, silty in part, sandy in part, possible intercrystalline porosity; common SHALE: as above, trace spotty light brown oil stain

11020-11030 ARGILLACEOUS DOLOMITE: mudstone, medium gray to gray-brown, pale green, cream to tan, fine crystalline, sucrosic texture, firm to friable, rare disseminated pyrite, silty in part, sandy in part, possible intercrystalline porosity, trace spotty light brown oil stain; common SHALE: light green, trace gray, friable, earthy texture, trace disseminated pyrite, no visible porosity, trace spotty light brown oil stain

11040-11050 ARGILLACEOUS DOLOMITE: mudstone, medium gray to gray-brown, pale green, cream to tan, fine crystalline, sucrosic texture, firm to friable, rare disseminated pyrite, silty in part, sandy in part, possible intercrystalline porosity, trace spotty light brown oil stain; common SHALE: as above, trace spotty light brown oil stain

11050-11060 ARGILLACEOUS DOLOMITE: mudstone, tan, pink, friable, earthy texture, trace disseminated pyrite, trace spotty light brown oil stain; common SHALE: as above, trace spotty light brown oil stain

11060-11070 DOLOMITE: mudstone, tan, pink, friable, earthy texture, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; common SHALE: as above, trace spotty light brown oil stain

11070-11080 DOLOMITE: mudstone, tan, pink, friable, earthy texture, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; common SHALE: as above, trace spotty light brown oil stain

11080-11130 DOLOMITE: mudstone, tan, pink, friable, earthy texture, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; common SHALE: as above, trace spotty light brown oil stain, fast moderately diffuse pale green cut fluorescence

Landed curve at 01:00 CDT, 11 July 2013

11130-11160 DOLOMITE: mudstone, tan, pink, friable, earthy texture, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; common SHALE: as above, trace spotty light brown oil stain, fast weak diffuse pale green cut fluorescence

11160-11190 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; common SHALE: as above; trace CLAYSTONE: light gray, medium gray to tan, occasional off white, massive, fine crystalline, dolomitic cement, trace disseminated pyrite, no visible porosity, trace spotty light brown oil stain, fast moderately diffuse pale green cut fluorescence

11190-11220 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; common SHALE: as above; trace CLAYSTONE: as above, fast moderately diffuse pale green cut fluorescence

11250-11250 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; common SHALE: as above; trace CLAYSTONE: as above, fast moderately diffuse pale green cut fluorescence

11250-11280 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; common SHALE: as above; trace CLAYSTONE: as above, fast moderately diffuse pale green cut fluorescence

11280-11310 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; SHALE: light green, trace gray, friable, earthy texture, trace disseminated pyrite, no visible porosity, trace spotty light brown oil stain, fast weak diffuse pale green cut fluorescence

11310-11340 DOLOMITE: mudstone, tan, pink, orange, off white, friable, sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; occasional SHALE: as above, fast weak diffuse pale green cut fluorescence

11340-11370 DOLOMITE: mudstone, tan, pink, orange, off white, friable, sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; occasional SHALE: as above, fast weak diffuse pale green cut fluorescence

11370-11400 DOLOMITE: mudstone, tan, pink, orange, off white, friable, sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; occasional SHALE: as above, fast weak diffuse pale green cut fluorescence

11400-11430 DOLOMITE: mudstone, tan, pink, orange, off white, friable, sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak diffuse pale green cut fluorescence

11430-11460 DOLOMITE: mudstone, tan, pink, orange, off white, friable, sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak diffuse pale green cut fluorescence

11460-11490 DOLOMITE: mudstone, tan, pink, orange, off white, friable, sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak diffuse pale green cut fluorescence

11490-11520 DOLOMITE: mudstone, tan, pink, friable, earthy texture, sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak diffuse pale green cut fluorescence

11520-11550 DOLOMITE: mudstone, tan, pink, friable, earthy texture, sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak diffuse pale green cut fluorescence

11550-11580 DOLOMITE: mudstone, tan, pink, friable, earthy texture, sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak cloudy pale green cut fluorescence

11580-11610 DOLOMITE: mudstone, tan, pink, friable, earthy texture, sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak cloudy pale green cut fluorescence

11610-11640 DOLOMITE: mudstone, tan, pink, friable, earthy texture, sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak cloudy pale green cut fluorescence

11640-11670 DOLOMITE: mudstone, tan, pink, friable, earthy texture, sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak cloudy pale green cut fluorescence

11670-11700 DOLOMITE: mudstone, tan, pink, friable, earthy texture, sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak cloudy pale green cut fluorescence

11700-11730 DOLOMITE: mudstone, tan, pink, friable, earthy texture, sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak diffuse pale green cut

11730-11760 DOLOMITE: mudstone, tan, pink, friable, earthy texture, sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; trace SHALE: as above, fast weak streaming becoming moderately diffuse pale green cut fluorescence

11760-11790 DOLOMITE: mudstone, tan, pink, friable, earthy texture, sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; trace SHALE: as above, fast weak streaming becoming moderately diffuse pale green cut fluorescence

11790-11820 DOLOMITE: mudstone, tan, pink, friable, earthy texture, sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; trace SHALE: as above, fast weak streaming becoming moderately diffuse pale green cut fluorescence

11820-11850 DOLOMITE: mudstone, tan, pink, friable, earthy texture, sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; trace SHALE: as above, fast moderately diffuse pale green cut fluorescence

11850-11880 DOLOMITE: mudstone, tan, pink, friable, earthy texture, sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast moderately diffuse pale green cut fluorescence

11880-11910 DOLOMITE: mudstone, tan, pink, friable, earthy texture, sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast moderately diffuse pale green cut fluorescence

11910-11940 DOLOMITE: mudstone, tan, pink, friable, earthy texture, sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast moderately diffuse pale green cut fluorescence

11940-11970 DOLOMITE: mudstone, tan, pink, friable, earthy texture, sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: light green, trace gray, friable, earthy texture, trace disseminated pyrite, no visible porosity, trace spotty light brown oil stain, fast moderately diffuse pale green cut fluorescence

11970-12000 DOLOMITE: mudstone, tan, pink, friable, earthy texture, sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: light green, trace gray, friable, earthy texture, trace disseminated pyrite, no visible porosity, trace spotty light brown oil stain, fast moderately diffuse pale green cut fluorescence

12000-12030 DOLOMITE: mudstone, tan, pink, friable, earthy texture, sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: light green, trace gray, friable, earthy texture, trace disseminated pyrite, no visible porosity, trace spotty light brown oil stain, fast moderately diffuse pale green cut fluorescence

12030-12060 DOLOMITE: mudstone, tan, pink, friable, earthy texture, sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: light green, trace gray, friable, earthy texture, trace disseminated pyrite, no visible porosity, trace spotty light brown oil stain, fast moderately diffuse pale green cut fluorescence

12060-12090 DOLOMITE: mudstone, tan, pink, friable, earthy texture, sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast moderately diffuse pale green cut fluorescence

12090-12120 DOLOMITE: mudstone, tan, pink, friable, earthy texture, sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast moderately cloudy pale green cut fluorescence

12120-12150 DOLOMITE: mudstone, tan, pink, friable, earthy texture, sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast moderately cloudy pale green cut fluorescence

12150-12180 DOLOMITE: mudstone, tan, pink, friable, earthy texture, sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast moderately cloudy pale green cut fluorescence

12180-12210 DOLOMITE: mudstone, tan, pink, friable, earthy texture, sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast moderately cloudy pale green cut fluorescence

12210-12240 DOLOMITE: mudstone, tan, pink, friable, earthy texture, sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast moderately cloudy pale green cut fluorescence

12240-12270 DOLOMITE: mudstone, tan, pink, friable, earthy texture, sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast moderately cloudy pale green cut fluorescence

12270-12300 DOLOMITE: mudstone, tan, pink, friable, earthy texture, sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast moderately cloudy pale green cut fluorescence

12300-12330 DOLOMITE: mudstone, tan, pink, friable, earthy texture, sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast moderately cloudy pale green cut fluorescence

12330-12360 DOLOMITE: mudstone, tan, pink, friable, earthy texture, sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast moderately cloudy pale green cut fluorescence

12360-12390 DOLOMITE: mudstone, tan, pink, friable, earthy texture, sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast moderately cloudy pale green cut fluorescence

12390-12420 DOLOMITE: mudstone, tan, pink, friable, earthy texture, sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast moderately cloudy pale green cut fluorescence

12420-12450 DOLOMITE: mudstone, tan, pink, friable, earthy texture, sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast moderately cloudy pale green cut fluorescence

12450-12480 DOLOMITE: mudstone, tan, pink, friable, earthy texture, sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast moderately cloudy pale green cut fluorescence

12480-12510 DOLOMITE: mudstone, tan, pink, friable, earthy texture, sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast moderately cloudy pale green cut fluorescence

12510-12540 DOLOMITE: mudstone, tan, pink, friable, earthy texture, sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast moderately cloudy pale green cut fluorescence

12540-12570 DOLOMITE: mudstone, tan, pink, friable, earthy texture, sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast moderately cloudy pale green cut fluorescence

12570-12600 DOLOMITE: mudstone, tan, pink, friable, earthy texture, sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast moderately cloudy pale green cut fluorescence

12600-12630 DOLOMITE: mudstone, tan, pink, friable, earthy texture, sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast moderately cloudy pale green cut fluorescence

12630-12660 DOLOMITE: mudstone, tan, pink, friable, earthy texture, sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast moderately cloudy pale green cut fluorescence

12660-12690 DOLOMITE: mudstone, tan, pink, friable, earthy texture, sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast moderately cloudy pale green cut fluorescence

12690-12720 DOLOMITE: mudstone, tan, pink, friable, earthy texture, sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast moderately cloudy pale green cut fluorescence

12720-12750 DOLOMITE: mudstone, tan, pink, friable, earthy texture, sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast moderately cloudy pale yellow cut fluorescence

12750-12780 DOLOMITE: mudstone, tan, pink, friable, earthy texture, sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast moderately cloudy pale yellow cut fluorescence

12780-12810 DOLOMITE: mudstone, tan, pink, gray, friable, earthy texture, sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast moderately cloudy pale yellow cut fluorescence

12810-12840 DOLOMITE: mudstone, tan, pink, gray, friable, earthy texture, sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast moderately cloudy yellow green cut fluorescence

12840-12870 DOLOMITE: mudstone, tan, pink, gray, friable, earthy texture, sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast moderately cloudy pale yellow cut fluorescence

12870-12900 DOLOMITE: mudstone, tan, pink, gray, friable, earthy texture, sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast moderately cloudy pale yellow cut fluorescence

12900-12930 DOLOMITE: mudstone, tan, pink, gray, friable, earthy texture, sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast moderately cloudy pale yellow cut fluorescence

12930-12960 DOLOMITE: mudstone, tan, pink, gray, friable, earthy texture, sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast moderately cloudy pale yellow cut fluorescence

12960-12990 DOLOMITE: mudstone, tan, pink, gray, friable, earthy texture, sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast moderately cloudy pale yellow cut fluorescence

12990-13020 DOLOMITE: mudstone, tan, pink, gray, friable, earthy texture, sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast moderately cloudy pale yellow cut fluorescence

13020-13050 DOLOMITE: mudstone, tan, pink, gray, friable, earthy texture, sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast moderately cloudy pale yellow cut fluorescence

13050-13080 DOLOMITE: mudstone, tan, pink, gray, friable, earthy texture, sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast moderately cloudy pale yellow cut fluorescence

13080-13110 DOLOMITE: mudstone, tan, pink, gray, friable, earthy texture, sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast moderately cloudy pale yellow cut fluorescence

13110-13140 DOLOMITE: mudstone, tan, pink, gray, friable, earthy texture, sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast moderately cloudy pale yellow cut fluorescence

13140-13170 DOLOMITE: mudstone, tan, pink, gray, friable, earthy texture, sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast moderately cloudy pale yellow cut fluorescence

13170-13200 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: light green, trace gray, friable, earthy texture, trace disseminated pyrite, no visible porosity, trace spotty light brown oil stain, fast weak diffuse pale green cut fluorescence

13200-13230 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; occasional SHALE: light green, trace gray, friable, earthy texture, trace disseminated pyrite, no visible porosity, trace spotty light brown oil stain, fast weak diffuse pale green cut fluorescence

13230-13260 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; occasional SHALE: as above, fast weak diffuse pale green cut fluorescence

13260-13290 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; occasional SHALE: as above, fast weak diffuse pale green cut fluorescence

13290-13320 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; occasional SHALE: as above, fast weak diffuse pale green cut fluorescence

13320-13350 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; occasional SHALE: as above, fast weak diffuse pale green cut fluorescence

13350-13380 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak diffuse pale green cut fluorescence

13380-13410 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak diffuse pale green cut fluorescence

13410-13440 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak diffuse pale green cut fluorescence

13440-13470 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak diffuse pale green cut fluorescence

13470-13500 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak diffuse pale green cut fluorescence

13500-13530 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak diffuse pale green cut fluorescence

13530-13560 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak diffuse pale green cut fluorescence

13560-13590 DOLOMITE: mudstone, tan, pink, friable, earthy texture, trace sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; occasional SHALE: as above, fast weak streaming becoming moderately diffuse pale green cut fluorescence

13590-13620 DOLOMITE: mudstone, tan, pink, friable, earthy texture, trace sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; occasional SHALE: as above, fast weak streaming becoming moderately diffuse pale green cut fluorescence

13620-13650 DOLOMITE: mudstone, tan, pink, friable, earthy texture, trace sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; occasional SHALE: as above, fast weak streaming becoming moderately diffuse pale green cut fluorescence

13650-13680 DOLOMITE: mudstone, tan, pink, friable, earthy texture, trace sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; occasional SHALE: as above, fast weak streaming becoming moderately diffuse pale green cut fluorescence

13680-13710 DOLOMITE: mudstone, tan, pink, friable, earthy texture, trace sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; occasional SHALE: as above, fast weak streaming becoming moderately diffuse pale green cut fluorescence

13710-13740 DOLOMITE: mudstone, tan, pink, friable, earthy texture, trace sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; occasional SHALE: as above, fast weak diffuse pale green cut fluorescence

13740-13770 DOLOMITE: mudstone, tan, pink, friable, earthy texture, trace sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; occasional SHALE: as above, fast weak diffuse pale green cut fluorescence

13770-13800 DOLOMITE: mudstone, tan, pink, friable, earthy texture, trace sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; occasional SHALE: as above, fast weak diffuse pale green cut fluorescence

13800-13830 DOLOMITE: mudstone, tan, pink, friable, earthy texture, trace sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; occasional SHALE: as above, fast weak diffuse pale green cut fluorescence

13830-13860 DOLOMITE: mudstone, tan, pink, friable, earthy texture, trace sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; occasional SHALE: as above, fast weak diffuse pale green cut fluorescence

13860-13890 DOLOMITE: mudstone, tan, pink, friable, earthy texture, trace sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; occasional SHALE: as above, fast weak diffuse pale green cut fluorescence

13890-13920 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; occasional SHALE: light green, trace gray, friable, earthy texture, trace disseminated pyrite, no visible porosity, trace spotty light brown oil stain, fast weak diffuse pale green cut fluorescence

13920-13950 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: light green, trace gray, friable, earthy texture, trace disseminated pyrite, no visible porosity, trace spotty light brown oil stain, fast weak diffuse pale green cut fluorescence

13950-13980 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak diffuse pale green cut fluorescence

13980-14010 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak diffuse pale green cut fluorescence

14010-14040 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak diffuse pale green cut fluorescence

14040-14070 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak diffuse pale green cut fluorescence

14070-14100 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak diffuse pale green cut fluorescence

14100-14130 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak diffuse pale green cut fluorescence

14130-14160 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak diffuse pale green cut fluorescence

14160-14190 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak diffuse pale green cut fluorescence

14190-14220DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak diffuse pale green cut fluorescence

14220-14250 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak diffuse pale green cut fluorescence

14250-14280 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak diffuse pale green cut fluorescence

14280-14310 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak diffuse pale green cut fluorescence

14310-14340 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak diffuse pale green cut fluorescence

14340-14370 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak diffuse pale green cut fluorescence

14370-14400 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak diffuse pale green cut fluorescence

14400-14430 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak diffuse pale green cut fluorescence

14430-14460 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak diffuse pale green cut fluorescence

14460-14490 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak diffuse pale green cut fluorescence

14490-14520 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak diffuse pale green cut fluorescence

14520-14550 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak diffuse pale green cut fluorescence

14550-14580 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak diffuse pale green cut fluorescence

14580-14610 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak diffuse pale green cut fluorescence

14610-14640 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak diffuse pale green cut fluorescence

14640-14670 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak diffuse pale green cut fluorescence

14670-14700 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; trace SHALE: as above, fast weak cloudy pale green cut fluorescence

14700-14730 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; trace SHALE: as above, fast weak cloudy pale green cut fluorescence

14730-14760 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; trace SHALE: as above, fast weak cloudy pale green cut fluorescence

14760-14790 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; trace SHALE: as above, fast weak cloudy pale green cut fluorescence

14790-14820 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; trace SHALE: light green, trace gray, friable, earthy texture, trace disseminated pyrite, no visible porosity, trace spotty light brown oil stain, fast weak cloudy pale green cut fluorescence

14820-14850 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; trace SHALE: as above; very trace CLAYSTONE: light gray, medium gray to tan, occasional off white, massive, fine crystalline, dolomitic cement, trace disseminated pyrite, no visible porosity, trace spotty light brown oil stain, fast weak cloudy pale green cut fluorescence

14850-14880 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; trace SHALE: as above; very trace CLAYSTONE: light gray, medium gray to tan, occasional off white, massive, fine crystalline, dolomitic cement, trace disseminated pyrite, no visible porosity, trace spotty light brown oil stain, fast weak cloudy pale green cut fluorescence

14880-14910 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; trace SHALE: as above; very trace CLAYSTONE: light gray, medium gray to tan, occasional off white, massive, fine crystalline, dolomitic cement, trace disseminated pyrite, no visible porosity, trace spotty light brown oil stain, fast weak cloudy pale green cut fluorescence

14910-14940 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above; trace CLAYSTONE: light gray, medium gray to tan, occasional off white, massive, fine crystalline, dolomitic cement, trace disseminated pyrite, no visible porosity, trace spotty light brown oil stain, fast weak cloudy pale green cut fluorescence

14940-14970 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above; rare CLAYSTONE: as above, fast weak cloudy pale green cut fluorescence

14970-15000 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above; rare CLAYSTONE: as above, fast weak cloudy pale green cut fluorescence

15000-15030 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above; rare CLAYSTONE: as above, fast weak cloudy pale green cut fluorescence

15030-15060 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above; rare CLAYSTONE: as above, fast weak cloudy pale green cut fluorescence

15060-15090 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above; rare CLAYSTONE: as above, fast weak cloudy pale green cut fluorescence

15090-15120 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above; rare CLAYSTONE: as above, fast weak cloudy pale green cut fluorescence

15120-15150 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above; rare CLAYSTONE: as above, fast weak cloudy pale green cut fluorescence

15150-15180 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above; rare CLAYSTONE: as above, fast weak cloudy pale green cut fluorescence

15180-15210 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above; rare CLAYSTONE: as above, fast weak cloudy pale green cut fluorescence

15210-15240 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above; rare CLAYSTONE: as above, fast weak cloudy pale green cut fluorescence

15240-15270 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above; rare CLAYSTONE: as above, fast weak cloudy pale green cut fluorescence

15270-15300 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above; rare CLAYSTONE: as above, fast weak cloudy pale green cut fluorescence

15300-15330 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above; rare CLAYSTONE: as above, fast weak cloudy pale green cut fluorescence

15330-15360 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above; rare CLAYSTONE: as above, fast weak cloudy pale green cut fluorescence

15360-15390 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above; rare CLAYSTONE: as above, fast weak cloudy pale green cut fluorescence

15390-15420 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above; rare CLAYSTONE: as above, fast weak cloudy pale green cut fluorescence

15420-15450 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above; rare CLAYSTONE: as above, fast weak cloudy pale green cut fluorescence

15450-15480 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above; rare CLAYSTONE: as above, fast weak cloudy pale green cut fluorescence

15480-15510 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above; rare CLAYSTONE: as above, fast weak cloudy pale green cut fluorescence

15510-15540 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above; rare CLAYSTONE: as above, fast weak cloudy pale green cut fluorescence

15540-15570 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above; rare CLAYSTONE: as above, fast weak cloudy pale green cut fluorescence

15570-15600 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak pale green cut

15600-15630 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak pale green cut

15630-15660 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak pale green cut

15660-15690 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak pale green cut

15690-15720 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak pale green cut

15720-15750 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak pale green cut

15750-15780 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak pale green cut

15780-15810 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak pale green cut

15810-15840 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak pale green cut

15840-15870 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak pale green cut

15870-15900 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak pale green cut

15900-15930 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak pale green cut

15930-15960 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak diffuse pale green cut

15960-15990 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; trace SHALE: as above, fast weak diffuse pale green cut

15990-16020 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; trace SHALE: as above, fast weak diffuse pale green cut

16020-16050 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; trace SHALE: as above, fast weak diffuse pale green cut

16050-16080 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; trace SHALE: as above, fast weak diffuse pale green cut

16080-16110 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; trace SHALE: as above, fast weak diffuse pale green cut

16110-16140 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; trace SHALE: as above, fast weak diffuse pale green cut

16140-16170 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; trace SHALE: as above, fast weak diffuse pale green cut

16170-16200 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; occasional SHALE: as above, fast weak cloudy pale green cut

16200-16230 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; occasional SHALE: as above, fast weak cloudy pale green cut

16230-16260 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; occasional SHALE: as above, fast weak cloudy pale green cut

16260-16290 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: light green, trace gray, friable, earthy texture, trace disseminated pyrite, no visible porosity, trace spotty light brown oil stain, fast weak cloudy pale green cut

16290-16320 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: light green, trace gray, friable, earthy texture, trace disseminated pyrite, no visible porosity, trace spotty light brown oil stain, fast weak cloudy pale green cut

16320-16350 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: light green, trace gray, friable, earthy texture, trace disseminated pyrite, no visible porosity, trace spotty light brown oil stain, fast weak cloudy pale green cut

16350-16380 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; trace SHALE: light green, trace gray, friable, earthy texture, trace disseminated pyrite, no visible porosity, trace spotty light brown oil stain, fast weak cloudy pale green cut

16380-16410 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; trace SHALE: light green, trace gray, friable, earthy texture, trace disseminated pyrite, no visible porosity, trace spotty light brown oil stain, fast weak diffuse pale green cut

16410-16440 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; trace SHALE: as above, fast weak cloudy pale green cut

16440-16470 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; trace SHALE: as above, fast weak cloudy pale green cut

16470-16500 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; trace SHALE: as above, fast weak cloudy pale green cut

16500-16530 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; trace SHALE: as above, fast weak cloudy pale green cut

16530-16560 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; trace SHALE: as above, fast weak cloudy pale green cut

16560-16590 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; trace SHALE: as above, fast weak cloudy pale green cut

16590-16620 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; trace SHALE: as above, fast weak cloudy pale green cut

16620-16650 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; trace SHALE: as above, fast weak cloudy pale green cut

16650-16680 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; trace SHALE: as above, fast weak cloudy pale green cut

16680-16710 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; trace SHALE: as above, fast weak cloudy pale green cut

16710-16740 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; trace SHALE: as above, fast weak cloudy pale green cut

16740-16770 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; trace SHALE: as above, fast weak cloudy pale green cut

16770-16800 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; trace SHALE: as above, fast weak cloudy pale green cut

16800-16830 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; trace SHALE: as above, fast weak cloudy pale green cut

16830-16860 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; trace SHALE: as above, fast weak cloudy pale green cut

16860-16890 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; trace SHALE: as above, fast weak cloudy pale green cut

16890-16920 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; trace SHALE: as above, fast weak cloudy pale green cut

16920-16950 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; trace SHALE: as above, fast weak cloudy pale green cut

16950-16980 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; trace SHALE: as above, fast weak cloudy pale green cut

16980-17010 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; trace SHALE: as above, fast weak cloudy pale green cut

17010-17040 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; trace SHALE: as above, fast weak cloudy pale green cut

17040-17070 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; trace SHALE: as above, fast weak cloudy pale green cut

17070-17100 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak cloudy pale green cut

17100-17130 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak cloudy pale green cut

17130-17160 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak cloudy pale green cut

17160-17190 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak cloudy pale green cut

17190-17220 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak cloudy pale green cut

17220-17250 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak cloudy pale green cut

17250-17280 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak cloudy pale green cut

17280-17310 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak cloudy pale green cut

17310-17340 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak diffuse pale green cut

17340-17370 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak diffuse pale green cut

17370-17400 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak diffuse pale green cut

17400-17430 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak streaming becoming moderately cloudy pale green cut

17430-17460 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak streaming becoming moderately cloudy pale green cut

17460-17490 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak streaming becoming moderately cloudy pale green cut

17490-17520 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak diffuse pale green cut

17520-17550 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak diffuse pale green cut

17550-17580 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak diffuse pale green cut

17580-17610 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak diffuse pale green cut

17610-17640 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak diffuse pale green cut

17640-17670 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak diffuse pale green cut

17670-17700 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak diffuse pale green cut

17700-17730 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak diffuse pale green cut

17730-17760 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak diffuse pale green cut

17760-17790 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak diffuse pale green cut

17790-17820 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak diffuse pale green cut

17820-17850 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak diffuse pale green cut

17850-17880 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak diffuse pale green cut

17880-17910 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak diffuse pale green cut

17910-17940 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak diffuse pale green cut

17940-17970 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak diffuse pale green cut

17970-18000 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak diffuse pale green cut

18000-18030 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak diffuse pale green cut

18030-18060 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak diffuse pale green cut

18060-18090 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak diffuse pale green cut

18090-18120 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak diffuse pale green cut

18120-18150 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak diffuse pale green cut

18150-18180 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak diffuse pale green cut

18180-18210 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak diffuse pale green cut

18210-18240 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak diffuse pale green cut

18240-18270 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak diffuse pale green cut

18270-18300 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak diffuse pale green cut

18300-18330 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak diffuse pale green cut

18330-18360 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak diffuse pale green cut

18360-18390 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak diffuse pale green cut

18390-18420 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak diffuse pale green cut

18420-18450 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak diffuse pale green cut

18450-18480 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak diffuse pale green cut

18480-18510 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak diffuse pale green cut

18510-18540 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak diffuse pale green cut

18540-18570 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak diffuse pale green cut

18570-18600 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak diffuse pale green cut

18600-18630 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak diffuse pale green cut

18630-18660 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak diffuse pale green cut

18660-18690 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; trace SHALE: as above, fast weak diffuse pale green cut

18690-18720 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; trace SHALE: as above, fast weak diffuse pale green cut

18720-18750 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; trace SHALE: as above, fast weak diffuse pale green cut

18750-18780 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; trace SHALE: as above, fast weak diffuse pale green cut

18780-18810 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; trace SHALE: as above, fast weak diffuse pale green cut

18810-18840 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: light green, trace gray, friable, earthy texture, trace disseminated pyrite, no visible porosity, trace spotty light brown oil stain, fast weak diffuse pale green cut

18840-18870 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: light green, trace gray, friable, earthy texture, trace disseminated pyrite, no visible porosity, trace spotty light brown oil stain, fast weak diffuse pale green cut

18870-18900 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: light green, trace gray, friable, earthy texture, trace disseminated pyrite, no visible porosity, trace spotty light brown oil stain, fast weak diffuse pale green cut

18900-18930 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: light green, trace gray, friable, earthy texture, trace disseminated pyrite, no visible porosity, trace spotty light brown oil stain, moderately lube contamination

18930-18960 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: light green, trace gray, friable, earthy texture, trace disseminated pyrite, no visible porosity, trace spotty light brown oil stain, moderately lube contamination

18960-18990 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: light green, trace gray, friable, earthy texture, trace disseminated pyrite, no visible porosity, trace spotty light brown oil stain, moderately lube contamination

18990-19020 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, moderately lube contamination

19020-19050 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, moderately lube contamination

19050-19080 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, moderately lube contamination

19080-19110 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, moderately lube contamination

19110-19140 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, moderately weak diffuse pale green cut fluorescence

19140-19170 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, moderately weak diffuse pale green cut fluorescence

19170-19200 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, moderately weak diffuse pale green cut fluorescence

19200-19230 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak diffuse pale green cut fluorescence

19230-19260 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak diffuse pale green cut fluorescence

19260-19290 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak diffuse pale green cut fluorescence

1929-19320 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak diffuse pale green cut fluorescence

19320-19350 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak diffuse pale green cut fluorescence

19350-19380 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak diffuse pale green cut fluorescence

19380-19410 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak diffuse pale green cut fluorescence

19410-19440 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak diffuse pale green cut fluorescence

19440-19470 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak diffuse pale green cut fluorescence

19470-19500 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above; trace CLAYSTONE: light gray, medium gray to tan, occasional off white, massive, fine crystalline, dolomitic cement, trace disseminated pyrite, no visible porosity, trace spotty light brown oil stain, fast weak cloudy pale green cut fluorescence

19500-19530 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above; trace CLAYSTONE: light gray, medium gray to tan, occasional off white, massive, fine crystalline, dolomitic cement, trace disseminated pyrite, no visible porosity, trace spotty light brown oil stain, fast weak cloudy pale green cut fluorescence

19530-19560 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above; trace CLAYSTONE: light gray, medium gray to tan, occasional off white, massive, fine crystalline, dolomitic cement, trace disseminated pyrite, no visible porosity, trace spotty light brown oil stain, fast weak cloudy pale green cut fluorescence

19560-19590 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above; trace CLAYSTONE: light gray, medium gray to tan, occasional off white, massive, fine crystalline, dolomitic cement, trace disseminated pyrite, no visible porosity, trace spotty light brown oil stain, fast weak cloudy pale green cut fluorescence

19590-19620 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above; trace CLAYSTONE: light gray, medium gray to tan, occasional off white, massive, fine crystalline, dolomitic cement, trace disseminated pyrite, no visible porosity, trace spotty light brown oil stain, fast weak cloudy pale green cut fluorescence

19620-19650 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above; trace CLAYSTONE: as above, fast weak cloudy pale green cut fluorescence

19650-19680 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above; trace CLAYSTONE: as above, fast weak cloudy pale green cut fluorescence

19680-19710 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above; trace CLAYSTONE: as above, fast weak cloudy pale green cut fluorescence

19710-19740 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above; trace CLAYSTONE: as above, fast weak cloudy pale green cut fluorescence

19740-19770 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above; trace CLAYSTONE: as above, fast weak cloudy pale green cut fluorescence

19770-19800 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak cloudy pale green cut fluorescence

19800-19830 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak cloudy pale green cut fluorescence

19830-19860 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak cloudy pale green cut fluorescence

19860-19890 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak cloudy pale green cut fluorescence

19890-19920 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak cloudy pale green cut fluorescence

19920-19950 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak cloudy pale green cut fluorescence

19950-19980 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak cloudy pale green cut fluorescence

19980-20010 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; rare SHALE: as above, fast weak cloudy pale green cut fluorescence

20010-20040 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; trace SHALE: as above, fast weak diffuse pale green cut fluorescence

20040-20070 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; trace SHALE: as above, fast weak diffuse pale green cut fluorescence

20070-20100 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; trace SHALE: as above, fast weak diffuse pale green cut fluorescence

20100-20130 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; trace SHALE: as above, fast weak diffuse pale green cut fluorescence

20130-20160 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; trace SHALE: as above, fast weak diffuse pale green cut fluorescence

20160-20190 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; trace SHALE: as above, fast weak diffuse pale green cut fluorescence

20190-20220 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; trace SHALE: as above, fast weak diffuse pale green cut fluorescence

20220-20250 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; trace SHALE: as above, fast weak diffuse pale green cut fluorescence

20250-20280 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; trace SHALE: light green, trace gray, friable, earthy texture, trace disseminated pyrite, no visible porosity, trace spotty light brown oil stain, fast weak diffuse pale green cut

20280-20310 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; trace SHALE: light green, trace gray, friable, earthy texture, trace disseminated pyrite, no visible porosity, trace spotty light brown oil stain, fast weak diffuse pale green cut

20310-20340 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; trace SHALE: light green, trace gray, friable, earthy texture, trace disseminated pyrite, no visible porosity, trace spotty light brown oil stain, fast weak diffuse pale green cut

20340-20370 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; trace SHALE: light green, trace gray, friable, earthy texture, trace disseminated pyrite, no visible porosity, trace spotty light brown oil stain, fast weak diffuse pale green cut

20370-20400 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; trace SHALE: light green, trace gray, friable, earthy texture, trace disseminated pyrite, no visible porosity, trace spotty light brown oil stain, fast weak diffuse pale green cut

20400-20430 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; trace SHALE: light green, trace gray, friable, earthy texture, trace disseminated pyrite, no visible porosity, trace spotty light brown oil stain, fast weak diffuse pale green cut

20430-20460 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; trace SHALE: as above, fast weak diffuse pale green cut

20460-20490 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; trace SHALE: as above, fast weak diffuse pale green cut

20490-20520 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; trace SHALE: as above, fast weak diffuse pale green cut

20520-20550 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; trace SHALE: as above, fast weak diffuse pale green cut

20550-20580 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; trace SHALE: as above, fast weak diffuse pale green cut

20580-20610 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; trace SHALE: as above, fast weak diffuse pale green cut

20610-20640 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; trace SHALE: as above, fast weak diffuse pale green cut

20640-20670 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; trace SHALE: as above, fast weak diffuse pale green cut
20670-20700 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; trace SHALE: as above, fast weak diffuse pale green cut

20700-20730 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; trace SHALE: as above, fast weak diffuse pale green cut

20730-20760 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; trace SHALE: as above, fast weak diffuse pale green cut

20760-20790 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; trace SHALE: as above, fast weak diffuse pale green cut

20709-20820 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; trace SHALE: as above, fast weak diffuse pale green cut

20820-20850 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; trace SHALE: as above, fast weak diffuse pale green cut

20850-20880 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; trace SHALE: as above, fast weak diffuse pale green cut

20880-20910 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; trace SHALE: as above, fast weak diffuse pale green cut

20910-20940 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; trace SHALE: as above, fast weak diffuse pale green cut

20940-20970 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; trace SHALE: as above, fast weak diffuse pale green cut

20970-21000 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; trace SHALE: as above, fast weak diffuse pale green cut

21000-21030 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; trace SHALE: as above, fast weak diffuse pale green cut

21030-21060 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; trace SHALE: as above, fast weak diffuse pale green cut

21060-21126 DOLOMITE: mudstone, tan, pink, friable, earthy texture, rare sucrosic texture, hard to firm, silty in part, sandy in part, trace disseminated pyrite, possible intercrystalline porosity, trace spotty light brown oil stain; trace SHALE: as above, fast weak diffuse pale green cut

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. **22221**

RECEIVED JUN 2013 OIL AND GAS DIVISION

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

☑ Notice of Intent	Approximate Start Date **June 25, 2013**	☐ Drilling Prognosis	☐ Spill Report
☐ Report of Work Done	Date Work Completed	☐ Redrilling or Repair	☐ Shooting
☐ Notice of Intent to Begin a Workover Project that may Qualify for a Tax Exemption Pursuant to NDCC Section 57-51.1-03.	Approximate Start Date	☐ Casing or Liner	☐ Acidizing
		☐ Plug Well	☐ Fracture Treatment
		☐ Supplemental History	☐ Change Production Method
		☐ Temporarily Abandon	☐ Reclamation
		☑ Other **Name change**	

Well Name and Number					
Innoko 5301 41-12T					
Footages	Qtr-Qtr	Section	Township	Range	
250 F S L 2350 F E L	SWSE	12	153 N	101 W	
Field	Pool	County			
Baker	**Bakken**	**McKenzie**			

24-HOUR PRODUCTION RATE

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

Name of Contractor(s)			
Address	City	State	Zip Code

DETAILS OF WORK

Oasis Petroleum respectfully requests permission a name change on the above referenced well:

Name changed to: Innoko 5301 43-12T

invoice # 38126 80 7/2/13 CC 25.00

Company **Oasis Petroleum North America LLC**		Telephone Number **281-404-9563**
Address **1001 Fannin, Suite 1500**		
City **Houston**	State **TX**	Zip Code **77002**
Signature Heather McCowan	Printed Name **Heather McCowan**	
Title **Regulatory Assistant**	Date **June 25, 2013**	
Email Address **hmccowan@oasispetroleum.com**		

FOR STATE USE ONLY

☐ Received	☑ Approved
Date 06-28-2013	
By David Burns	
Title David Burns Engineering Tech.	

SUNDRY NOTICES AND REPORTS ON WELLS - FORM 4

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

JUN 2013 RECEIVED ND OIL & GAS DIVISION

Well File No. 22221

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

☑ Notice of Intent	Approximate Start Date **June 10, 2013**	☑ Drilling Prognosis	☐ Spill Report
☐ Report of Work Done	Date Work Completed	☐ Redrilling or Repair	☐ Shooting
☐ Notice of Intent to Begin a Workover Project that may Qualify for a Tax Exemption Pursuant to NDCC Section 57-51.1-03.	Approximate Start Date	☐ Casing or Liner	☐ Acidizing
		☐ Plug Well	☐ Fracture Treatment
		☐ Supplemental History	☐ Change Production Method
		☐ Temporarily Abandon	☐ Reclamation
		☑ Other **Waiver to rule Rule 43-02-03-31**	

Well Name and Number					
Innoko 5301 41-12T					
Footages	Qtr-Qtr	Section	Township	Range	
250 F S L 2350 F E L	**SWSE**	**12**	**153 N**	**101 W**	
Field	Pool	County			
	Bakken	**McKenzie**			

24-HOUR PRODUCTION RATE

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

Name of Contractor(s)			
Address	City	State	Zip Code

DETAILS OF WORK

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

The Gulf Oil/ Lindvig 1-11-3C located within a mile of the subject well

*Approved per logs run on # 9309 - Lindvig 1-11 HR

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

Company **Oasis Petroleum North America LLC**			Telephone Number **281-404-9563**
Address **1001 Fannin, Suite 1500**			
City **Houston**		State **TX**	Zip Code **77002**
Signature Heather McCowan	Printed Name **Heather McCowan**		
Title **Regulatory Assistant**	Date **June 10, 2013**		
Email Address **hmccowan@oasispetroleum.com**			

FOR STATE USE ONLY

☐ Received	☑ Approved
Date 6-20-2013	
By	
Title Richard A. Suggs Geologist	

SUNDRY NOTICES AND REPORTS ON WELLS - FORM

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

JUN 2013 RECEIVED ND OIL & GAS DIVISION

Well File No. **22221**

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

- [x] Notice of Intent — Approximate Start Date: **June 6, 2013**
- [ ] Report of Work Done — Date Work Completed:
- [ ] Notice of Intent to Begin a Workover Project that may Qualify for a Tax Exemption Pursuant to NDCC Section 57-51.1-03. — Approximate Start Date:

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

Well Name and Number					
Innoko 5301 43-12T					
Footages	Qtr-Qtr	Section	Township	Range	
250 F S L 2410 F E L	**SWSE**	**12**	**153 N**	**101 W**	
Field	Pool	County			
Baker	**Bakken**	**McKenzie**			

24-HOUR PRODUCTION RATE

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

Name of Contractor(s)			
Address	City	State	Zip Code

DETAILS OF WORK

We respectfully request permission to revise the APD issued for this well to include the following change:
The surface location will change to 250' FSL & 2350' FEL, Sec. 12-153N-101W. (This modification was made to accomodate the drilling rigs)
Correlating to this surface location the new casing point will be 210' FNL & 2520' FEL, Sec. 13-153N-101W

The following statements remain true:
Notice has been provided to the owner of any permanently occupied dwelling within 1320 feet.
This well is not located within 500 feet of an occupied dwelling.

Attached is the new well plat, drill plan, directional plan, and directional plot.

Company		Telephone Number
Oasis Petroleum Inc.		**(281) 404-9563**
Address		
1001 Fannin, Suite 1500		
City	State	Zip Code
Houston	**TX**	**77002**
Signature: Heather McCowan	Printed Name: **Heather McCowan**	
Title: **Regulatory Assistant**	Date: **June 6, 2013**	
Email Address: **hmccowan@oasispetroleum.com**		

FOR STATE USE ONLY

- [ ] Received
- [x] Approved

Date: 6-7-13

By: Nathaniel Erbele

Title: Petroleum Resource Specialist

WELL LOCATION PLAT

OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 1500, HOUSTON, TX 77002
"INNOKO 5301 43-12T"
250 FEET FROM SOUTH LINE AND 2350 FEET FROM EAST LINE
SECTION 12, T153N, R101W, 5TH P.M., MCKENZIE COUNTY, NORTH DAKOTA

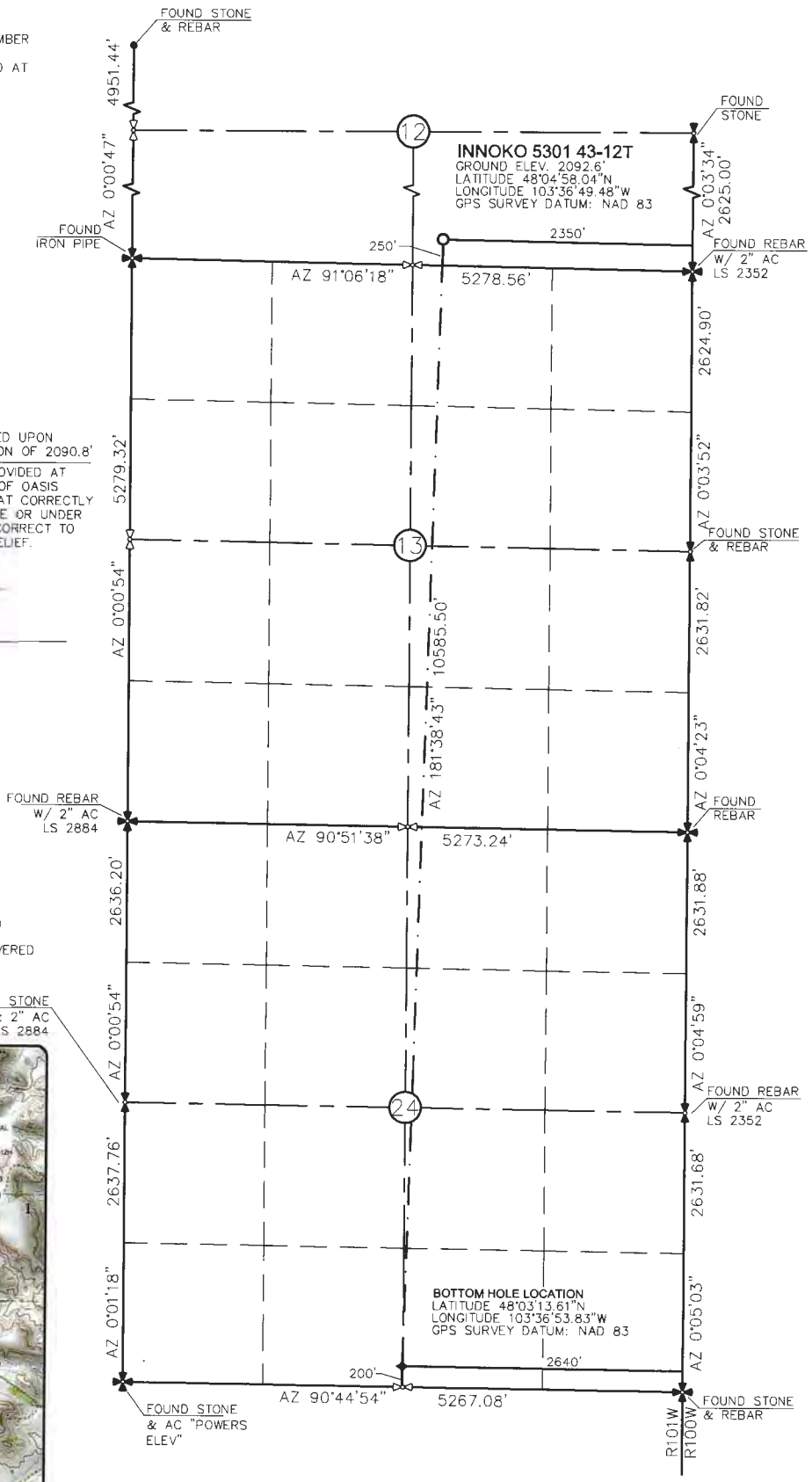
THIS DOCUMENT WAS ORIGINALLY ISSUED AND SEALED BY DARYL D. KASEMAN, PLS, REGISTRATION NUMBER 3880 ON 6/05/13 AND THE ORIGINAL DOCUMENTS ARE STORED AT THE OFFICES OF INTERSTATE ENGINEERING, INC.

REGISTERED LAND SURVEYOR
DARYL D. KASEMAN
LS-3880
DATE: 6/05/13
NORTH DAKOTA

STAKED ON 12/6/11
VERTICAL CONTROL DATUM WAS BASED UPON CONTROL POINT 13 WITH AN ELEVATION OF 2090.8'

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

DARYL D. KASEMAN, LS-3880



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1/8
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INTERSTATE ENGINEERING
Professionals you need, people you trust

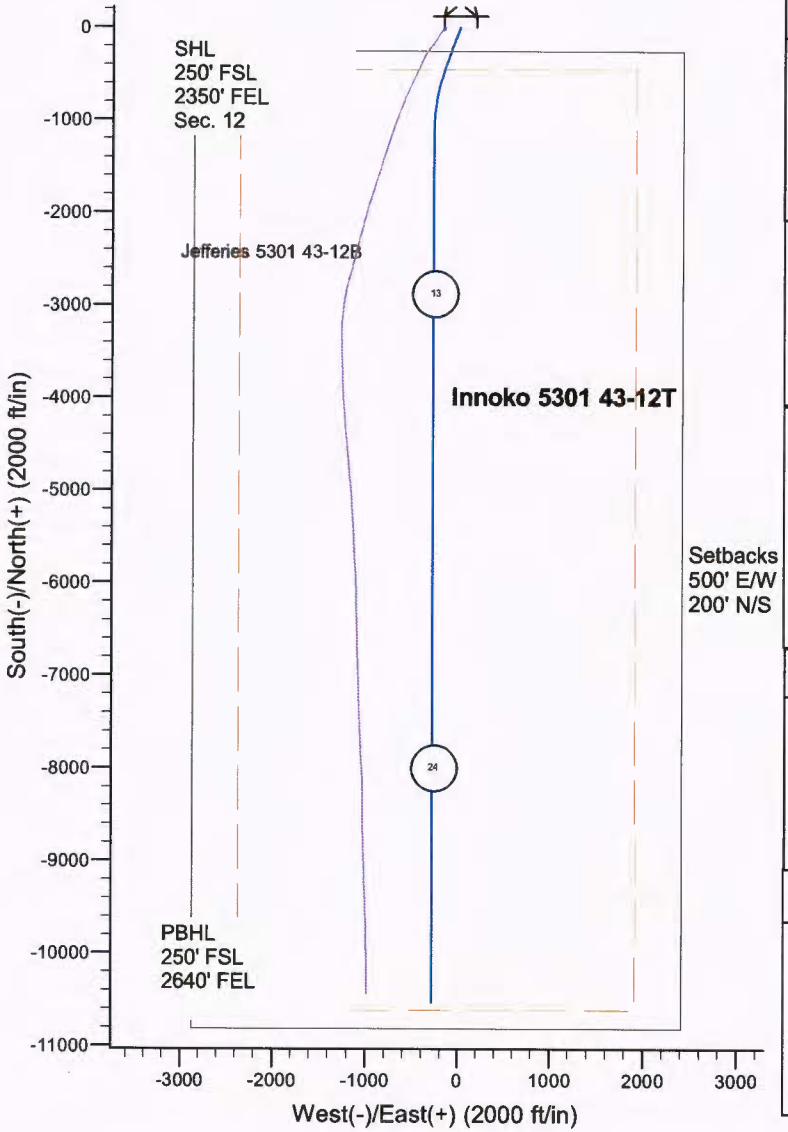
Interstate Engineering, Inc.
P.O. Box 648
425 East Main Street
Sidney, Montana 59270
Ph (406) 433-5617
Fax (406) 433-5618
www.interstateeng.com
Other offices in Minnesota, North Dakota and South Dakota

OASIS PETROLEUM NORTH AMERICA, LLC
WELL LOCATION PLAT
SECTION 12, T153N, R101W
MCKENZIE COUNTY, NORTH DAKOTA

Drawn By: J.J.S. | Project No.: S11-09-361
Checked By: D.D.K. | Date: DEC 2011

Revision No.	Date	By	Description
REV 1	1/19/12	JJS	SWAPPED WELL LOCATIONS
REV 2	2/5/13	BHH	MOVED BOTTOM HOLE / CHANGED NAME
REV 3	2/14/13	JJS	REVISED WELL CALL
REV 4	6/05/13	JJS	MOVED WELL 80'

S:\2011\S11-09-361 OASIS PETROLEUM LLC\INNOKO 5301 43-12T\12-153N-101W\CAD\Innoko.dwg -- 6/6/2013 8:03 AM josh schmierer



Setbacks
500' E/W
200' N/S

WELL DETAILS: Innoko 5301 43-12T

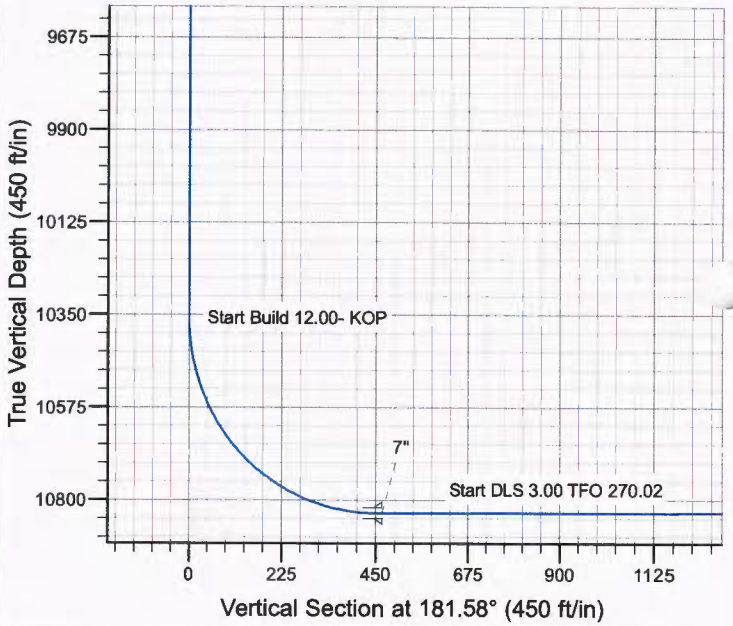
Ground Level: 2093.0

Northing	Easting	Latitude	Longitude
125075.65	368085.94	48° 4' 58.050 N	103° 36' 49.476 W

Project: Indian Hills
Site: 153N-101W-13/24
Well: Innoko 5301 43-12T
Wellbore: Innoko 5301 43-12T
Design: INNOKO 5301 43-12T PLAN

Azimuths to True North
Magnetic North: 8.34°

Magnetic Field
Strength: 56589.9snT
Dip Angle: 73.02°
Date: 3/28/2013
Model: IGRF200510

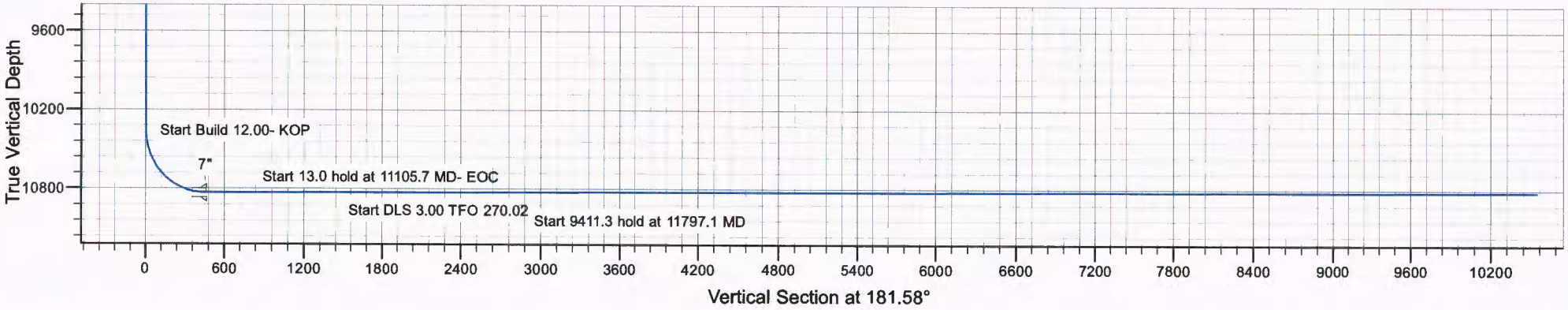


CASING DETAILS

TVD	MD	Name	Size
2100.0	2100.0	9 5/8"	9.625
10832.4	11119.0	7"	7.000

SECTION DETAILS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	
10355.0	0.00	0.00	10355.0	0.0	0.0	0.00	
11105.7	90.09	200.35	10832.5	-448.4	-166.3	12.00	
11118.7	90.09	200.35	10832.4	-460.6	-170.8	0.00	
11797.1	90.09	180.00	10831.4	-1124.7	-290.0	3.00	
21208.4	90.09	180.00	10816.4	-10536.0	-290.0	0.00	



DRILLING PLAN

OPERATOR	Oasis Petroleum	**COUNTY/STATE**	McKenzie Co., ND
WELL NAME	INNOKO 5301 43-12T	**RIG**	Nabors B25
WELL TYPE	Horizontal Three Forks		
LOCATION	SWSW 12-153N-101W	Surface Location (survey plat): 250' fsl	2350' fwl
EST. T.D.	21,208'	**GROUND ELEV:**	2093 Finished Pad Elev. **Sub Height:** 25
	TOTAL LATERAL: 10,089' (est)	**KB ELEV:**	2118

PROGNOSIS: Based on 2,118' KB(est)

MARKER		DEPTH (Surf Loc)	DATUM (Surf Loc)
Pierre	NDIC MAP	2,018	100'
Greenhorn		4,646	-2,528'
Mowry		5,036	-2,918'
Dakota		5,463	-3,345'
Rierdon		6,382	-4,264'
Dunham Salt		6,899	-4,781'
Dunham Salt Base		6,976	-4,858'
Spearfish		6,986	-4,868'
Pine Salt		7,277	-5,159'
Pine Salt Base		7,333	-5,215'
Opeche Salt		7,360	-5,242'
Opeche Salt Base		7,399	-5,281'
Broom Creek (Top of Minnelusa Gp.)		7,804	-5,486'
Amsden		7,663	-5,545'
Tyler		7,852	-5,734'
Otter (Base of Minnelusa Gp.)		8,024	-5,906'
Kibbey		8,375	-6,257'
Charles Salt		8,522	-6,404'
UB		9,148	-7,030'
Base Last Salt		9,224	-7,106'
Ratcliffe		9,268	-7,150'
Mission Canyon		9,443	-7,325'
Lodgepole		10,009	-7,891'
Lodgepole Fracture Zone		10,194	-8,076'
False Bakken		10,717	-8,599'
Upper Bakken		10,726	-8,608'
Middle Bakken		10,736	-8,618'
Lower Bakken		10,777	-8,659'
Pronghorn		10,790	-8,672'
Three Forks		10,806	-8,688'
Three Forks Target Top		10,814	-8,696'
Three Forks Target Base		10,832	-8,714'
Claystone		10,834	-8,716'

Dip Rate: overall +0.09° or .16'/100' up (complex)

Max. Anticipated BHP: 4686

LOGS:

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

REQUEST LOG WAIVER Gulf Oil Lindvig 1-11-3C 3620' to the NW 153N 101W S11

DEVIATION:

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

DST'S:

None planned

CORES:

None planned

MUDLOGGING:

Two-Man: 8,322'
~200' above the Charles (Kibbey) to Casing point; Casing point to TD
30' samples at direction of wellsite geologist; 10' through target @ curve land

BOP:

11" 5000 psi blind, pipe & annular

Surface Formation: *Glacial till*

MUD:	Interval		Type	WT	Vis	WL	Remarks
Surface:	0' -	2,100'	FW/Gel - Lime Sweeps	8.4-9.0	28-32	NC	Circ Mud Tanks
Intermediate:	2,100' -	11,119'	Invert	9.5-10.4	40-50	30+HtHp	Circ Mud Tanks
Lateral:	11,119' -	21,208'	Salt Water	9.8-10.2	28-32	NC	Circ Mud Tanks

CASING:	Size	Wt ppf	Hole	Depth		Cement	WOC	Remarks
Surface:	9-5/8"	36#	13-1/2"	2,100'		To Surface	12	100' into Pierre
Intermediate:	7"	32#	8-3/4"	11,119'		3,963'	24	1500' above Dakota
Production Liner:	4.5"	13.5#	6"	21,208'	TOL @ 10,305'			50' above KOP

PROBABLE PLUGS, IF REQ'D:

OTHER:

	MD	TVD	FNL/FSL	FEL/FWL	S-T-R	AZI
Surface:	2,100	2,118	250' FSL	2350' FEL	Sec. 12 T153N-R101W	Survey Company:
KOP:	10,355'	10,355'	250' FSL	2350' FEL	Sec. 12 T153N-R101W	Build Rate: 12 deg /100'
EOC:	11,106'	10,832'	198' FNL	2516' FEL	Sec. 13 T153N-R101W	200.3
Casing Point:	11,119'	10,832'	210' FNL	2520' FEL	Sec. 13 T153N-R101W	180.0
Middle Bakken Lateral TD:	21,208'	10,816'	250' FSL	2640' FEL	Sec. 24 T153N-R101W	180.0

Comments:

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

OASIS PETROLEUM

Geology: 1/0/1900 **Engineering: S. Dunlap 4/5/13**

Oasis

Indian Hills
153N-101W-13/24
Innoko 5301 43-12T
T153N R101W SEC 12
Innoko 5301 43-12T

Plan: INNOKO 5301 43-12T PLAN 1

Standard Planning Report

05 June, 2013

Database:	OpenWellsCompass - EDM Prod	**Local Co-ordinate Reference:**	Well Innoko 5301 43-12T
Company:	Oasis	**TVD Reference:**	WELL @ 2118.0ft (Original Well Elev)
Project:	Indian Hills	**MD Reference:**	WELL @ 2118.0ft (Original Well Elev)
Site:	153N-101W-13/24	**North Reference:**	True
Well:	Innoko 5301 43-12T	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Innoko 5301 43-12T		
Design:	INNOKO 5301 43-12T PLAN 1		

Project Indian Hills

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

Site 153N-101W-13/24

Site Position:		**Northing:**	125,067.66 m	**Latitude:**	48° 4' 57.960 N
From:	Lat/Long	**Easting:**	368,214.56 m	**Longitude:**	103° 36' 43.250 W
Position Uncertainty:	0.0 ft	**Slot Radius:**	13.200 in	**Grid Convergence:**	-2.32 °

Well Innoko 5301 43-12T

Well Position	**+N/-S**	9.1 ft	**Northing:**	125,075.65 m	**Latitude:**	48° 4' 58.050 N
	+E/-W	-422.7 ft	**Easting:**	368,085.94 m	**Longitude:**	103° 36' 49.476 W
Position Uncertainty		0.0 ft	**Wellhead Elevation:**		**Ground Level:**	2,093.0 ft

Wellbore Innoko 5301 43-12T

Magnetics	**Model Name**	**Sample Date**	**Declination (°)**	**Dip Angle (°)**	**Field Strength (nT)**
	IGRF200510	3/28/2013	8.34	73.02	56,590

Design INNOKO 5301 43-12T PLAN 1

Audit Notes:

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

Vertical Section:	**Depth From (TVD) (ft)**	**+N/-S (ft)**	**+E/-W (ft)**	**Direction (°)**
	0.0	0.0	0.0	181.58

Plan Sections

Measured Depth (ft)	**Inclination (°)**	**Azimuth (°)**	**Vertical Depth (ft)**	**+N/-S (ft)**	**+E/-W (ft)**	**Dogleg Rate (°/100ft)**	**Build Rate (°/100ft)**	**Turn Rate (°/100ft)**	**TFO (°)**	**Target**
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
10,355.0	0.00	0.00	10,355.0	0.0	0.0	0.00	0.00	0.00	0.00	
11,105.7	90.09	200.35	10,832.5	-448.4	-166.3	12.00	12.00	0.00	200.35	
11,118.7	90.09	200.35	10,832.4	-460.6	-170.8	0.00	0.00	0.00	0.00	
11,797.1	90.09	180.00	10,831.4	-1,124.7	-290.0	3.00	0.00	-3.00	270.02	
21,208.4	90.09	180.00	10,816.4	-10,536.0	-290.0	0.00	0.00	0.00	0.00	

Database:	OpenWellsCompass - EDM Prod	**Local Co-ordinate Reference:**	Well Innoko 5301 43-12T
Company:	Oasis	**TVD Reference:**	WELL @ 2118.0ft (Original Well Elev)
Project:	Indian Hills	**MD Reference:**	WELL @ 2118.0ft (Original Well Elev)
Site:	153N-101W-13/24	**North Reference:**	True
Well:	Innoko 5301 43-12T	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Innoko 5301 43-12T		
Design:	INNOKO 5301 43-12T PLAN 1		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
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
2,018.0	0.00	0.00	2,018.0	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
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
4,646.0	0.00	0.00	4,646.0	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

Database:	OpenWellsCompass - EDM Prod	**Local Co-ordinate Reference:**	Well Innoko 5301 43-12T
Company:	Oasis	**TVD Reference:**	WELL @ 2118.0ft (Original Well Elev)
Project:	Indian Hills	**MD Reference:**	WELL @ 2118.0ft (Original Well Elev)
Site:	153N-101W-13/24	**North Reference:**	True
Well:	Innoko 5301 43-12T	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Innoko 5301 43-12T		
Design:	INNOKO 5301 43-12T PLAN 1		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
4,800.0	0.00	0.00	4,800.0	0.0	0.0	0.0	0.00	0.00	0.00
4,900.0	0.00	0.00	4,900.0	0.0	0.0	0.0	0.00	0.00	0.00
5,000.0	0.00	0.00	5,000.0	0.0	0.0	0.0	0.00	0.00	0.00
5,036.0	0.00	0.00	5,036.0	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
5,463.0	0.00	0.00	5,463.0	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
6,382.0	0.00	0.00	6,382.0	0.0	0.0	0.0	0.00	0.00	0.00
Rierdon									
6,400.0	0.00	0.00	6,400.0	0.0	0.0	0.0	0.00	0.00	0.00
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
6,899.0	0.00	0.00	6,899.0	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
6,976.0	0.00	0.00	6,976.0	0.0	0.0	0.0	0.00	0.00	0.00
Dunham Salt Base									
6,986.0	0.00	0.00	6,986.0	0.0	0.0	0.0	0.00	0.00	0.00
Spearfish									
7,000.0	0.00	0.00	7,000.0	0.0	0.0	0.0	0.00	0.00	0.00
7,100.0	0.00	0.00	7,100.0	0.0	0.0	0.0	0.00	0.00	0.00
7,200.0	0.00	0.00	7,200.0	0.0	0.0	0.0	0.00	0.00	0.00
7,277.0	0.00	0.00	7,277.0	0.0	0.0	0.0	0.00	0.00	0.00
Pine Salt									
7,300.0	0.00	0.00	7,300.0	0.0	0.0	0.0	0.00	0.00	0.00
7,333.0	0.00	0.00	7,333.0	0.0	0.0	0.0	0.00	0.00	0.00
Pine Salt Base									
7,360.0	0.00	0.00	7,360.0	0.0	0.0	0.0	0.00	0.00	0.00
Opeche Salt									
7,399.0	0.00	0.00	7,399.0	0.0	0.0	0.0	0.00	0.00	0.00
Opeche Salt Base									
7,400.0	0.00	0.00	7,400.0	0.0	0.0	0.0	0.00	0.00	0.00
7,500.0	0.00	0.00	7,500.0	0.0	0.0	0.0	0.00	0.00	0.00
7,600.0	0.00	0.00	7,600.0	0.0	0.0	0.0	0.00	0.00	0.00
7,604.0	0.00	0.00	7,604.0	0.0	0.0	0.0	0.00	0.00	0.00
Broom Creek (Top of Minnelusa Gp.)									
7,663.0	0.00	0.00	7,663.0	0.0	0.0	0.0	0.00	0.00	0.00

Database:	OpenWellsCompass - EDM Prod	**Local Co-ordinate Reference:**	Well Innoko 5301 43-12T
Company:	Oasis	**TVD Reference:**	WELL @ 2118.0ft (Original Well Elev)
Project:	Indian Hills	**MD Reference:**	WELL @ 2118.0ft (Original Well Elev)
Site:	153N-101W-13/24	**North Reference:**	True
Well:	Innoko 5301 43-12T	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Innoko 5301 43-12T		
Design:	INNOKO 5301 43-12T PLAN 1		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
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
7,852.0	0.00	0.00	7,852.0	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
8,024.0	0.00	0.00	8,024.0	0.0	0.0	0.0	0.00	0.00	0.00
Otter (Base of Minnelusa Gp.)									
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
8,375.0	0.00	0.00	8,375.0	0.0	0.0	0.0	0.00	0.00	0.00
Kibbey									
8,400.0	0.00	0.00	8,400.0	0.0	0.0	0.0	0.00	0.00	0.00
8,500.0	0.00	0.00	8,500.0	0.0	0.0	0.0	0.00	0.00	0.00
8,522.0	0.00	0.00	8,522.0	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
9,148.0	0.00	0.00	9,148.0	0.0	0.0	0.0	0.00	0.00	0.00
UB									
9,200.0	0.00	0.00	9,200.0	0.0	0.0	0.0	0.00	0.00	0.00
9,224.0	0.00	0.00	9,224.0	0.0	0.0	0.0	0.00	0.00	0.00
Base Last Salt									
9,268.0	0.00	0.00	9,268.0	0.0	0.0	0.0	0.00	0.00	0.00
Ratcliffe									
9,300.0	0.00	0.00	9,300.0	0.0	0.0	0.0	0.00	0.00	0.00
9,400.0	0.00	0.00	9,400.0	0.0	0.0	0.0	0.00	0.00	0.00
9,443.0	0.00	0.00	9,443.0	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
10,000.0	0.00	0.00	10,000.0	0.0	0.0	0.0	0.00	0.00	0.00
10,009.0	0.00	0.00	10,009.0	0.0	0.0	0.0	0.00	0.00	0.00
Lodgepole									
10,100.0	0.00	0.00	10,100.0	0.0	0.0	0.0	0.00	0.00	0.00
10,194.0	0.00	0.00	10,194.0	0.0	0.0	0.0	0.00	0.00	0.00
Lodgepole Fracture Zone									
10,200.0	0.00	0.00	10,200.0	0.0	0.0	0.0	0.00	0.00	0.00
10,300.0	0.00	0.00	10,300.0	0.0	0.0	0.0	0.00	0.00	0.00
10,355.0	0.00	0.00	10,355.0	0.0	0.0	0.0	0.00	0.00	0.00
Start Build 12.00- KOP									
10,375.0	2.40	200.35	10,375.0	-0.4	-0.1	0.4	12.00	12.00	0.00
10,400.0	5.40	200.35	10,399.9	-2.0	-0.7	2.0	12.00	12.00	0.00

Database:	OpenWellsCompass - EDM Prod	**Local Co-ordinate Reference:**	Well Innoko 5301 43-12T
Company:	Oasis	**TVD Reference:**	WELL @ 2118.0ft (Original Well Elev)
Project:	Indian Hills	**MD Reference:**	WELL @ 2118.0ft (Original Well Elev)
Site:	153N-101W-13/24	**North Reference:**	True
Well:	Innoko 5301 43-12T	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Innoko 5301 43-12T		
Design:	INNOKO 5301 43-12T PLAN 1		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
10,425.0	8.40	200.35	10,424.7	-4.8	-1.8	4.8	12.00	12.00	0.00
10,450.0	11.40	200.35	10,449.4	-8.8	-3.3	8.9	12.00	12.00	0.00
10,475.0	14.40	200.35	10,473.7	-14.1	-5.2	14.2	12.00	12.00	0.00
10,500.0	17.40	200.35	10,497.8	-20.5	-7.6	20.7	12.00	12.00	0.00
10,525.0	20.40	200.35	10,521.4	-28.1	-10.4	28.4	12.00	12.00	0.00
10,550.0	23.40	200.35	10,544.6	-36.8	-13.7	37.2	12.00	12.00	0.00
10,575.0	26.40	200.35	10,567.3	-46.7	-17.3	47.1	12.00	12.00	0.00
10,600.0	29.40	200.35	10,589.4	-57.7	-21.4	58.2	12.00	12.00	0.00
10,625.0	32.40	200.35	10,610.8	-69.7	-25.8	70.4	12.00	12.00	0.00
10,650.0	35.40	200.35	10,631.6	-82.8	-30.7	83.6	12.00	12.00	0.00
10,675.0	38.40	200.35	10,651.6	-96.8	-35.9	97.8	12.00	12.00	0.00
10,700.0	41.40	200.35	10,670.8	-111.9	-41.5	113.0	12.00	12.00	0.00
10,717.0	43.44	200.35	10,683.3	-122.6	-45.5	123.8	12.00	12.00	0.00
False Bakken									
10,725.0	44.40	200.35	10,689.1	-127.8	-47.4	129.1	12.00	12.00	0.00
10,726.0	44.52	200.35	10,689.8	-128.5	-47.7	129.7	12.00	12.00	0.00
Upper Bakken									
10,736.0	45.72	200.35	10,696.8	-135.1	-50.1	136.4	12.00	12.00	0.00
Middle Bakken									
10,750.0	47.40	200.35	10,706.5	-144.7	-53.7	146.1	12.00	12.00	0.00
10,775.0	50.40	200.35	10,722.9	-162.3	-60.2	163.9	12.00	12.00	0.00
10,777.0	50.64	200.35	10,724.2	-163.8	-60.7	165.4	12.00	12.00	0.00
Lower Bakken									
10,790.0	52.20	200.35	10,732.3	-173.3	-64.3	175.0	12.00	12.00	0.00
Pronghorn									
10,800.0	53.40	200.35	10,738.3	-180.8	-67.0	182.5	12.00	12.00	0.00
10,806.0	54.12	200.35	10,741.9	-185.3	-68.7	187.1	12.00	12.00	0.00
Three Forks									
10,825.0	56.40	200.35	10,752.7	-199.9	-74.2	201.9	12.00	12.00	0.00
10,850.0	59.40	200.35	10,766.0	-219.8	-81.5	221.9	12.00	12.00	0.00
10,875.0	62.40	200.35	10,778.1	-240.3	-89.1	242.6	12.00	12.00	0.00
10,900.0	65.40	200.35	10,789.1	-261.3	-96.9	263.9	12.00	12.00	0.00
10,925.0	68.40	200.35	10,798.9	-282.9	-104.9	285.6	12.00	12.00	0.00
10,950.0	71.40	200.35	10,807.5	-304.9	-113.1	307.9	12.00	12.00	0.00
10,975.0	74.40	200.35	10,814.9	-327.3	-121.4	330.5	12.00	12.00	0.00
11,000.0	77.40	200.35	10,821.0	-350.0	-129.8	353.4	12.00	12.00	0.00
11,025.0	80.40	200.35	10,825.8	-373.0	-138.4	376.7	12.00	12.00	0.00
11,050.0	83.40	200.35	10,829.3	-396.2	-147.0	400.1	12.00	12.00	0.00
11,075.0	86.40	200.35	10,831.5	-419.6	-155.6	423.7	12.00	12.00	0.00
11,100.0	89.40	200.35	10,832.4	-443.0	-164.3	447.3	12.00	12.00	0.00
11,105.7	90.09	200.35	10,832.5	-448.4	-166.3	452.8	12.00	12.00	0.00
Start 13.0 hold at 11105.7 MD- EOC									
11,118.7	90.09	200.35	10,832.4	-460.6	-170.8	465.1	0.00	0.00	0.00
Start DLS 3.00 TFO 270.02									
11,119.0	90.09	200.34	10,832.4	-460.8	-170.9	465.3	3.00	0.00	-3.00
7"									
11,200.0	90.09	197.91	10,832.3	-537.3	-197.4	542.5	3.00	0.00	-3.00
11,300.0	90.09	194.91	10,832.2	-633.2	-225.7	639.2	3.00	0.00	-3.00
11,400.0	90.09	191.91	10,832.0	-730.5	-248.9	737.1	3.00	0.00	-3.00
11,500.0	90.09	188.91	10,831.8	-828.8	-267.0	835.9	3.00	0.00	-3.00
11,600.0	90.09	185.91	10,831.7	-928.0	-279.9	935.3	3.00	0.00	-3.00
11,700.0	90.09	182.91	10,831.5	-1,027.7	-287.6	1,035.2	3.00	0.00	-3.00
11,797.1	90.09	180.00	10,831.4	-1,124.7	-290.0	1,132.3	3.00	0.00	-3.00

Database:	OpenWellsCompass - EDM Prod	**Local Co-ordinate Reference:**	Well Innoko 5301 43-12T
Company:	Oasis	**TVD Reference:**	WELL @ 2118.0ft (Original Well Elev)
Project:	Indian Hills	**MD Reference:**	WELL @ 2118.0ft (Original Well Elev)
Site:	153N-101W-13/24	**North Reference:**	True
Well:	Innoko 5301 43-12T	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Innoko 5301 43-12T		
Design:	INNOKO 5301 43-12T PLAN 1		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
Start 9411.3 hold at 11797.1 MD									
11,800.0	90.09	180.00	10,831.4	-1,127.6	-290.0	1,135.2	0.00	0.00	0.00
11,900.0	90.09	180.00	10,831.2	-1,227.6	-290.0	1,235.1	0.00	0.00	0.00
12,000.0	90.09	180.00	10,831.0	-1,327.6	-290.0	1,335.1	0.00	0.00	0.00
12,100.0	90.09	180.00	10,830.9	-1,427.6	-290.0	1,435.1	0.00	0.00	0.00
12,200.0	90.09	180.00	10,830.7	-1,527.6	-290.0	1,535.0	0.00	0.00	0.00
12,300.0	90.09	180.00	10,830.6	-1,627.6	-290.0	1,635.0	0.00	0.00	0.00
12,400.0	90.09	180.00	10,830.4	-1,727.6	-290.0	1,735.0	0.00	0.00	0.00
12,500.0	90.09	180.00	10,830.2	-1,827.6	-290.0	1,834.9	0.00	0.00	0.00
12,600.0	90.09	180.00	10,830.1	-1,927.6	-290.0	1,934.9	0.00	0.00	0.00
12,700.0	90.09	180.00	10,829.9	-2,027.6	-290.0	2,034.8	0.00	0.00	0.00
12,800.0	90.09	180.00	10,829.8	-2,127.6	-290.0	2,134.8	0.00	0.00	0.00
12,900.0	90.09	180.00	10,829.6	-2,227.6	-290.0	2,234.8	0.00	0.00	0.00
13,000.0	90.09	180.00	10,829.4	-2,327.6	-290.0	2,334.7	0.00	0.00	0.00
13,100.0	90.09	180.00	10,829.3	-2,427.6	-290.0	2,434.7	0.00	0.00	0.00
13,200.0	90.09	180.00	10,829.1	-2,527.6	-290.0	2,534.7	0.00	0.00	0.00
13,300.0	90.09	180.00	10,829.0	-2,627.6	-290.0	2,634.6	0.00	0.00	0.00
13,400.0	90.09	180.00	10,828.8	-2,727.6	-290.0	2,734.6	0.00	0.00	0.00
13,500.0	90.09	180.00	10,828.6	-2,827.6	-290.0	2,834.5	0.00	0.00	0.00
13,600.0	90.09	180.00	10,828.5	-2,927.6	-290.0	2,934.5	0.00	0.00	0.00
13,700.0	90.09	180.00	10,828.3	-3,027.6	-290.0	3,034.5	0.00	0.00	0.00
13,800.0	90.09	180.00	10,828.2	-3,127.6	-290.0	3,134.4	0.00	0.00	0.00
13,900.0	90.09	180.00	10,828.0	-3,227.6	-290.0	3,234.4	0.00	0.00	0.00
14,000.0	90.09	180.00	10,827.8	-3,327.6	-290.0	3,334.4	0.00	0.00	0.00
14,100.0	90.09	180.00	10,827.7	-3,427.6	-290.0	3,434.3	0.00	0.00	0.00
14,200.0	90.09	180.00	10,827.5	-3,527.6	-290.0	3,534.3	0.00	0.00	0.00
14,300.0	90.09	180.00	10,827.4	-3,627.6	-290.0	3,634.2	0.00	0.00	0.00
14,400.0	90.09	180.00	10,827.2	-3,727.6	-290.0	3,734.2	0.00	0.00	0.00
14,500.0	90.09	180.00	10,827.1	-3,827.6	-290.0	3,834.2	0.00	0.00	0.00
14,600.0	90.09	180.00	10,826.9	-3,927.6	-290.0	3,934.1	0.00	0.00	0.00
14,700.0	90.09	180.00	10,826.7	-4,027.6	-290.0	4,034.1	0.00	0.00	0.00
14,800.0	90.09	180.00	10,826.6	-4,127.6	-290.0	4,134.0	0.00	0.00	0.00
14,900.0	90.09	180.00	10,826.4	-4,227.6	-290.0	4,234.0	0.00	0.00	0.00
15,000.0	90.09	180.00	10,826.3	-4,327.6	-290.0	4,334.0	0.00	0.00	0.00
15,100.0	90.09	180.00	10,826.1	-4,427.6	-290.0	4,433.9	0.00	0.00	0.00
15,200.0	90.09	180.00	10,825.9	-4,527.6	-290.0	4,533.9	0.00	0.00	0.00
15,300.0	90.09	180.00	10,825.8	-4,627.6	-290.0	4,633.9	0.00	0.00	0.00
15,400.0	90.09	180.00	10,825.6	-4,727.6	-290.0	4,733.8	0.00	0.00	0.00
15,500.0	90.09	180.00	10,825.5	-4,827.6	-290.0	4,833.8	0.00	0.00	0.00
15,600.0	90.09	180.00	10,825.3	-4,927.6	-290.0	4,933.7	0.00	0.00	0.00
15,700.0	90.09	180.00	10,825.1	-5,027.6	-290.0	5,033.7	0.00	0.00	0.00
15,800.0	90.09	180.00	10,825.0	-5,127.6	-290.0	5,133.7	0.00	0.00	0.00
15,900.0	90.09	180.00	10,824.8	-5,227.6	-290.0	5,233.6	0.00	0.00	0.00
16,000.0	90.09	180.00	10,824.7	-5,327.6	-290.0	5,333.6	0.00	0.00	0.00
16,100.0	90.09	180.00	10,824.5	-5,427.6	-290.0	5,433.6	0.00	0.00	0.00
16,200.0	90.09	180.00	10,824.3	-5,527.6	-290.0	5,533.5	0.00	0.00	0.00
16,300.0	90.09	180.00	10,824.2	-5,627.6	-290.0	5,633.5	0.00	0.00	0.00
16,400.0	90.09	180.00	10,824.0	-5,727.6	-290.0	5,733.4	0.00	0.00	0.00
16,500.0	90.09	180.00	10,823.9	-5,827.6	-290.0	5,833.4	0.00	0.00	0.00
16,600.0	90.09	180.00	10,823.7	-5,927.6	-290.0	5,933.4	0.00	0.00	0.00
16,700.0	90.09	180.00	10,823.5	-6,027.6	-290.0	6,033.3	0.00	0.00	0.00
16,800.0	90.09	180.00	10,823.4	-6,127.6	-290.0	6,133.3	0.00	0.00	0.00
16,900.0	90.09	180.00	10,823.2	-6,227.6	-290.0	6,233.2	0.00	0.00	0.00

Database:	OpenWellsCompass - EDM Prod	**Local Co-ordinate Reference:**	Well Innoko 5301 43-12T
Company:	Oasis	**TVD Reference:**	WELL @ 2118.0ft (Original Well Elev)
Project:	Indian Hills	**MD Reference:**	WELL @ 2118.0ft (Original Well Elev)
Site:	153N-101W-13/24	**North Reference:**	True
Well:	Innoko 5301 43-12T	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Innoko 5301 43-12T		
Design:	INNOKO 5301 43-12T PLAN 1		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
17,000.0	90.09	180.00	10,823.1	-6,327.6	-290.0	6,333.2	0.00	0.00	0.00
17,100.0	90.09	180.00	10,822.9	-6,427.6	-290.0	6,433.2	0.00	0.00	0.00
17,200.0	90.09	180.00	10,822.7	-6,527.6	-290.0	6,533.1	0.00	0.00	0.00
17,300.0	90.09	180.00	10,822.6	-6,627.6	-290.0	6,633.1	0.00	0.00	0.00
17,400.0	90.09	180.00	10,822.4	-6,727.6	-290.0	6,733.1	0.00	0.00	0.00
17,500.0	90.09	180.00	10,822.3	-6,827.6	-290.0	6,833.0	0.00	0.00	0.00
17,600.0	90.09	180.00	10,822.1	-6,927.6	-290.0	6,933.0	0.00	0.00	0.00
17,700.0	90.09	180.00	10,821.9	-7,027.6	-290.0	7,032.9	0.00	0.00	0.00
17,800.0	90.09	180.00	10,821.8	-7,127.6	-290.0	7,132.9	0.00	0.00	0.00
17,900.0	90.09	180.00	10,821.6	-7,227.6	-290.0	7,232.9	0.00	0.00	0.00
18,000.0	90.09	180.00	10,821.5	-7,327.6	-290.0	7,332.8	0.00	0.00	0.00
18,100.0	90.09	180.00	10,821.3	-7,427.6	-290.0	7,432.8	0.00	0.00	0.00
18,200.0	90.09	180.00	10,821.2	-7,527.6	-290.0	7,532.8	0.00	0.00	0.00
18,300.0	90.09	180.00	10,821.0	-7,627.6	-290.0	7,632.7	0.00	0.00	0.00
18,400.0	90.09	180.00	10,820.8	-7,727.6	-290.0	7,732.7	0.00	0.00	0.00
18,500.0	90.09	180.00	10,820.7	-7,827.6	-290.0	7,832.6	0.00	0.00	0.00
18,600.0	90.09	180.00	10,820.5	-7,927.6	-290.0	7,932.6	0.00	0.00	0.00
18,700.0	90.09	180.00	10,820.4	-8,027.6	-290.0	8,032.6	0.00	0.00	0.00
18,800.0	90.09	180.00	10,820.2	-8,127.6	-290.0	8,132.5	0.00	0.00	0.00
18,900.0	90.09	180.00	10,820.0	-8,227.6	-290.0	8,232.5	0.00	0.00	0.00
19,000.0	90.09	180.00	10,819.9	-8,327.6	-290.0	8,332.5	0.00	0.00	0.00
19,100.0	90.09	180.00	10,819.7	-8,427.6	-290.0	8,432.4	0.00	0.00	0.00
19,200.0	90.09	180.00	10,819.6	-8,527.6	-290.0	8,532.4	0.00	0.00	0.00
19,300.0	90.09	180.00	10,819.4	-8,627.6	-290.0	8,632.3	0.00	0.00	0.00
19,400.0	90.09	180.00	10,819.2	-8,727.6	-290.0	8,732.3	0.00	0.00	0.00
19,500.0	90.09	180.00	10,819.1	-8,827.6	-290.0	8,832.3	0.00	0.00	0.00
19,600.0	90.09	180.00	10,818.9	-8,927.6	-290.0	8,932.2	0.00	0.00	0.00
19,700.0	90.09	180.00	10,818.8	-9,027.6	-290.0	9,032.2	0.00	0.00	0.00
19,800.0	90.09	180.00	10,818.6	-9,127.6	-290.0	9,132.1	0.00	0.00	0.00
19,900.0	90.09	180.00	10,818.4	-9,227.6	-290.0	9,232.1	0.00	0.00	0.00
20,000.0	90.09	180.00	10,818.3	-9,327.6	-290.0	9,332.1	0.00	0.00	0.00
20,100.0	90.09	180.00	10,818.1	-9,427.6	-290.0	9,432.0	0.00	0.00	0.00
20,200.0	90.09	180.00	10,818.0	-9,527.6	-290.0	9,532.0	0.00	0.00	0.00
20,300.0	90.09	180.00	10,817.8	-9,627.6	-290.0	9,632.0	0.00	0.00	0.00
20,400.0	90.09	180.00	10,817.6	-9,727.6	-290.0	9,731.9	0.00	0.00	0.00
20,500.0	90.09	180.00	10,817.5	-9,827.6	-290.0	9,831.9	0.00	0.00	0.00
20,600.0	90.09	180.00	10,817.3	-9,927.6	-290.0	9,931.8	0.00	0.00	0.00
20,700.0	90.09	180.00	10,817.2	-10,027.6	-290.0	10,031.8	0.00	0.00	0.00
20,800.0	90.09	180.00	10,817.0	-10,127.6	-290.0	10,131.8	0.00	0.00	0.00
20,900.0	90.09	180.00	10,816.8	-10,227.6	-290.0	10,231.7	0.00	0.00	0.00
21,000.0	90.09	180.00	10,816.7	-10,327.6	-290.0	10,331.7	0.00	0.00	0.00
21,100.0	90.09	180.00	10,816.5	-10,427.6	-290.0	10,431.7	0.00	0.00	0.00
21,208.4	90.09	180.00	10,816.4	-10,536.0	-290.0	10,540.0	0.00	0.00	0.00

TD at 21208.4

Casing Points

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (in)	Hole Diameter (in)
2,100.0	2,100.0	9 5/8"	9.625	13.500
11,119.0	10,832.4	7"	7.000	8.750

Database:	OpenWellsCompass - EDM Prod	**Local Co-ordinate Reference:**	Well Innoko 5301 43-12T
Company:	Oasis	**TVD Reference:**	WELL @ 2118.0ft (Original Well Elev)
Project:	Indian Hills	**MD Reference:**	WELL @ 2118.0ft (Original Well Elev)
Site:	153N-101W-13/24	**North Reference:**	True
Well:	Innoko 5301 43-12T	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Innoko 5301 43-12T		
Design:	INNOKO 5301 43-12T PLAN 1		

Formations

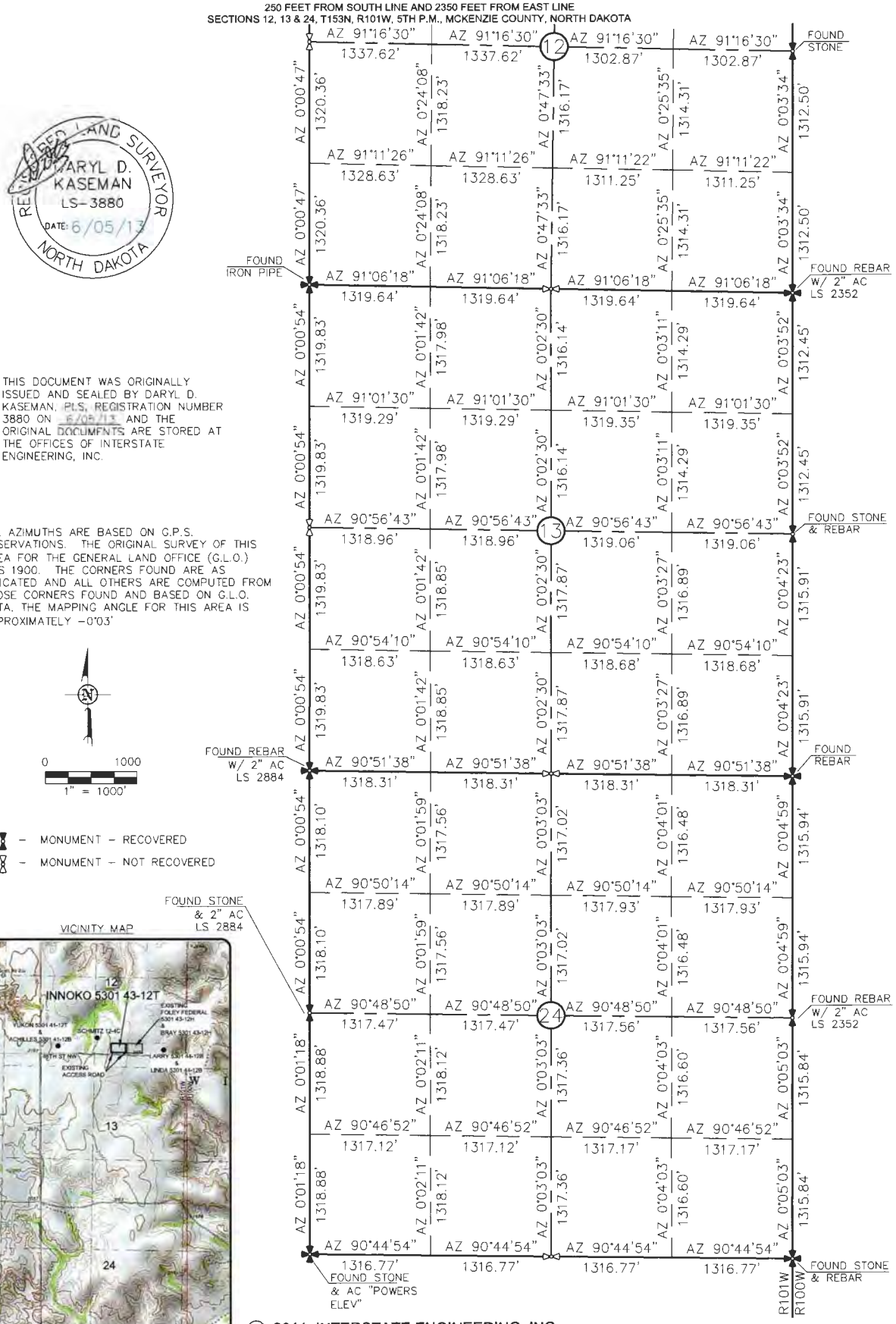
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
2,018.0	2,018.0	Pierre			
4,646.0	4,646.0	Greenhorn			
5,036.0	5,036.0	Mowry			
5,463.0	5,463.0	Dakota			
6,382.0	6,382.0	Rierdon			
6,899.0	6,899.0	Dunham Salt			
6,976.0	6,976.0	Dunham Salt Base			
6,986.0	6,986.0	Spearfish			
7,277.0	7,277.0	Pine Salt			
7,333.0	7,333.0	Pine Salt Base			
7,360.0	7,360.0	Opeche Salt			
7,399.0	7,399.0	Opeche Salt Base			
7,604.0	7,604.0	Broom Creek (Top of Minnelusa Gp.)			
7,663.0	7,663.0	Amsden			
7,852.0	7,852.0	Tyler			
8,024.0	8,024.0	Otter (Base of Minnelusa Gp.)			
8,375.0	8,375.0	Kibbey			
8,522.0	8,522.0	Charles Salt			
9,148.0	9,148.0	UB			
9,224.0	9,224.0	Base Last Salt			
9,268.0	9,268.0	Ratcliffe			
9,443.0	9,443.0	Mission Canyon			
10,009.0	10,009.0	Lodgepole			
10,194.0	10,194.0	Lodgepole Fracture Zone			
10,717.0	10,683.3	False Bakken			
10,726.0	10,689.8	Upper Bakken			
10,736.0	10,696.8	Middle Bakken			
10,777.0	10,724.2	Lower Bakken			
10,790.0	10,732.3	Pronghorn			
10,806.0	10,741.9	Three Forks			

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates +N/-S (ft)	Local Coordinates +E/-W (ft)	Comment
10,355.0	10,355.0	0.0	0.0	Start Build 12.00- KOP
11,105.7	10,832.5	-448.4	-166.3	Start 13.0 hold at 11105.7 MD- EOC
11,118.7	10,832.4	-460.6	-170.8	Start DLS 3.00 TFO 270.02
11,797.1	10,831.4	-1,124.7	-290.0	Start 9411.3 hold at 11797.1 MD
21,208.4	10,816.4	-10,536.0	-290.0	TD at 21208.4

SECTION BREAKDOWN

OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 1500, HOUSTON, TX 77002
"INNOKO 5301 43-12T"
250 FEET FROM SOUTH LINE AND 2350 FEET FROM EAST LINE
SECTIONS 12, 13 & 24, T153N, R101W, 5TH P.M., MCKENZIE COUNTY, NORTH DAKOTA



REGISTERED LAND SURVEYOR
DARYL D. KASEMAN
LS-3880
DATE: 6/05/13
NORTH DAKOTA

THIS DOCUMENT WAS ORIGINALLY ISSUED AND SEALED BY DARYL D. KASEMAN, PLS, REGISTRATION NUMBER 3880 ON 6/05/13 AND THE ORIGINAL DOCUMENTS ARE STORED AT THE OFFICES OF INTERSTATE ENGINEERING, INC.

ALL AZIMUTHS ARE BASED ON G.P.S. OBSERVATIONS. THE ORIGINAL SURVEY OF THIS AREA FOR THE GENERAL LAND OFFICE (G.L.O.) WAS 1900. 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'

0 1000
1" = 1000'

✠ – MONUMENT – RECOVERED
✠ – MONUMENT – NOT RECOVERED

VICINITY MAP

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Other offices in Minnesota, North Dakota and South Dakota

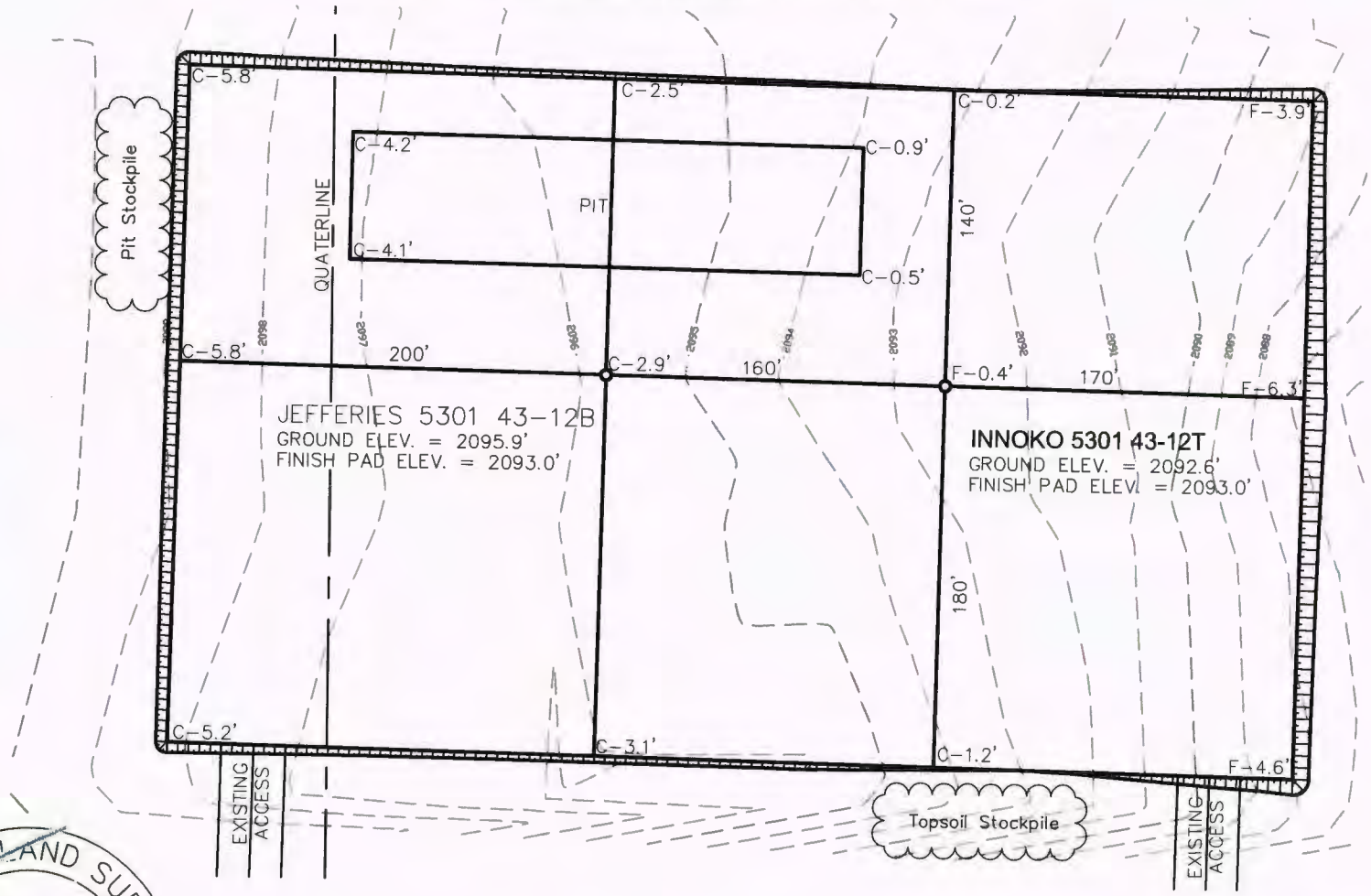
OASIS PETROLEUM NORTH AMERICA, LLC
SECTION BREAKDOWN
SECTIONS 12, 13 & 24, T153N, R101W
MCKENZIE COUNTY, NORTH DAKOTA

Drawn By: J.J.S. | Project No.: S11-09-361
Checked By: D.D.K. | Date: DEC 2011

Revision No.	Date	By	Description
REV 1	1/16/12	JJS	SWAPPED WELL LOCATIONS
REV 2	2/5/13	BHH	MOVED BOTTOM HOLE / CHANGED NAME
REV 4	6/05/13	JJS	MOVED WELL 60'

PAD LAYOUT

OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 1500, HOUSTON, TX 77002
"INNOKO 5301 43-12T"
250 FEET FROM SOUTH LINE AND 2350 FEET FROM EAST LINE
SECTION 12, T153N, R101W, 5TH P.M., MCKENZIE COUNTY, NORTH DAKOTA



REGISTERED LAND SURVEYOR
DARYL D. KASEMAN
LS-3880
DATE: 6/05/13
NORTH DAKOTA

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

0 80
1" = 80'

Revision No.	Date	By	Description
REV 1	1/19/12	JJS	SHAPPED WELL LOCATIONS
REV 2	2/5/13	BKH	MOVED BOTTOM HOLE / CHANGED NAME
REV 4	6/05/13	JJS	MOVED WELL 60'

OASIS PETROLEUM NORTH AMERICA, LLC
PAD LAYOUT
SECTION 12, T153N, R101W
MCKENZIE COUNTY, NORTH DAKOTA

Drawn By: J.J.S. Project No.: S11-0-361
Checked By: D.D.K. Date: DEC 2011

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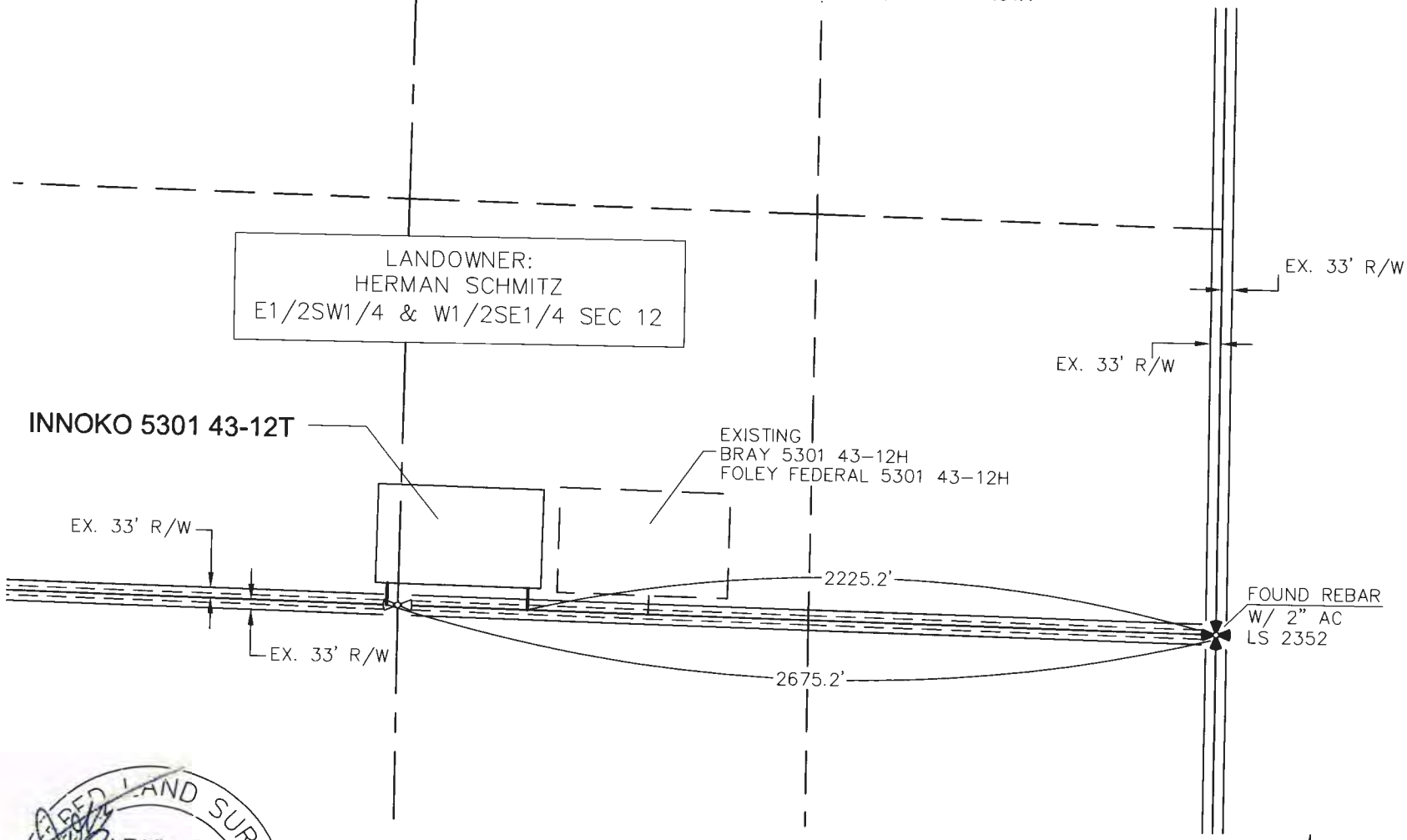
ACCESS APPROACH

OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 1500, HOUSTON, TX 77002
"INNOKO 5301 43-12T"
250 FEET FROM SOUTH LINE AND 2350 FEET FROM EAST LINE
SECTION 12, T153N, R101W, 5TH P.M., MCKENZIE COUNTY, NORTH DAKOTA



REGISTERED LAND SURVEYOR
DARYL D. KASEMAN
LS-3880
DATE: 6/05/13
NORTH DAKOTA

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

0 500
1" = 500'

Revision No.	Date	By	Description
REV 1	1/19/12	JJS	SWAPPED WELL LOCATIONS
REV 2	2/3/13	BHH	MOVED BOTTOM HOLE / CHANGED NAME
REV 4	5/05/13	JJS	MOVED WELL 90'

OASIS PETROLEUM NORTH AMERICA, LLC
ACCESS APPROACH
SECTION 12, T153N, R101W
MCKENZIE COUNTY, NORTH DAKOTA

Drawn By: J.J.S. Project No.: S11-09-361
Checked By: D.D.K. Date: DEC 2011

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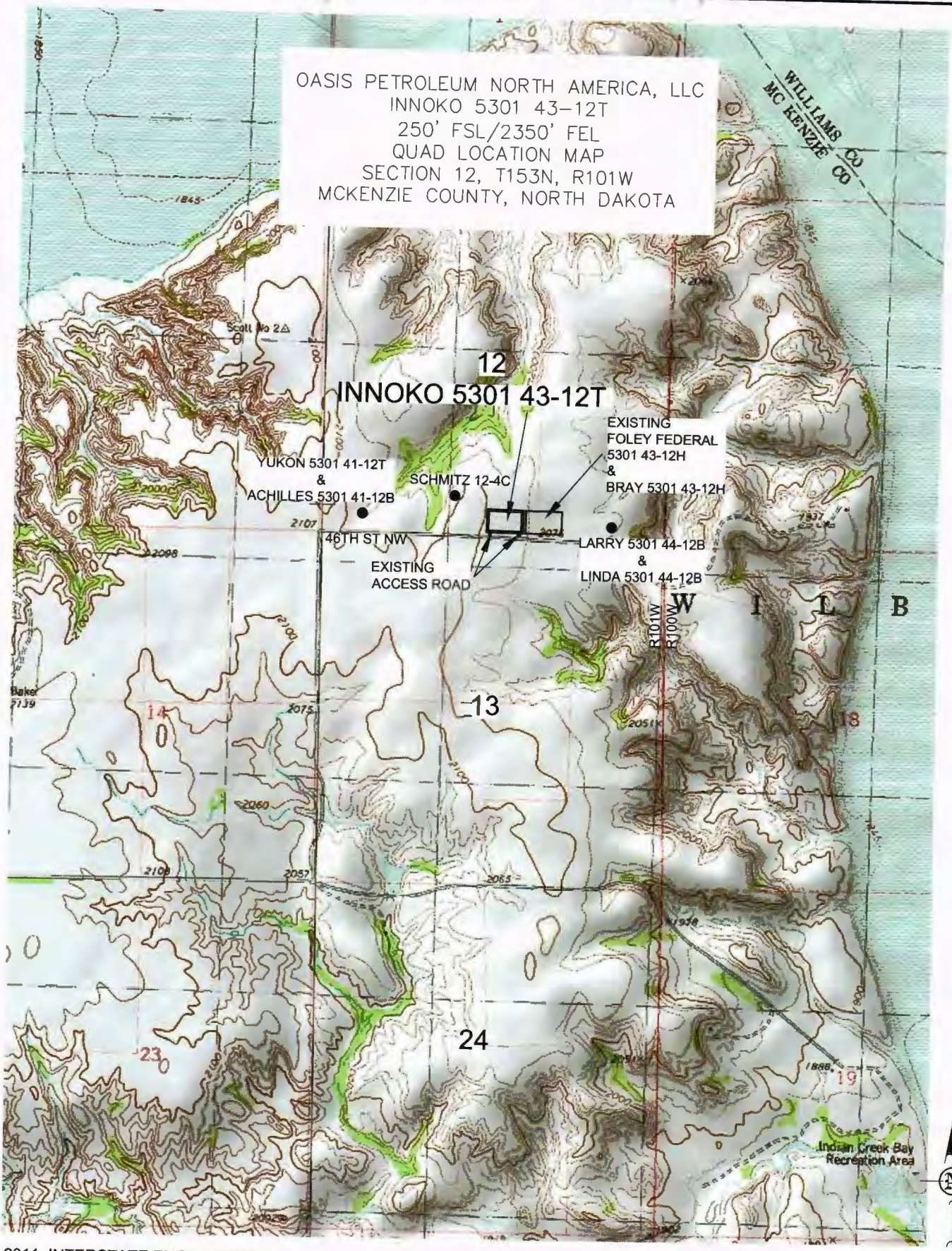

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Ph (406) 433-5617
Fax (406) 433-5618
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Other offices in Minnesota, North Dakota and South Dakota

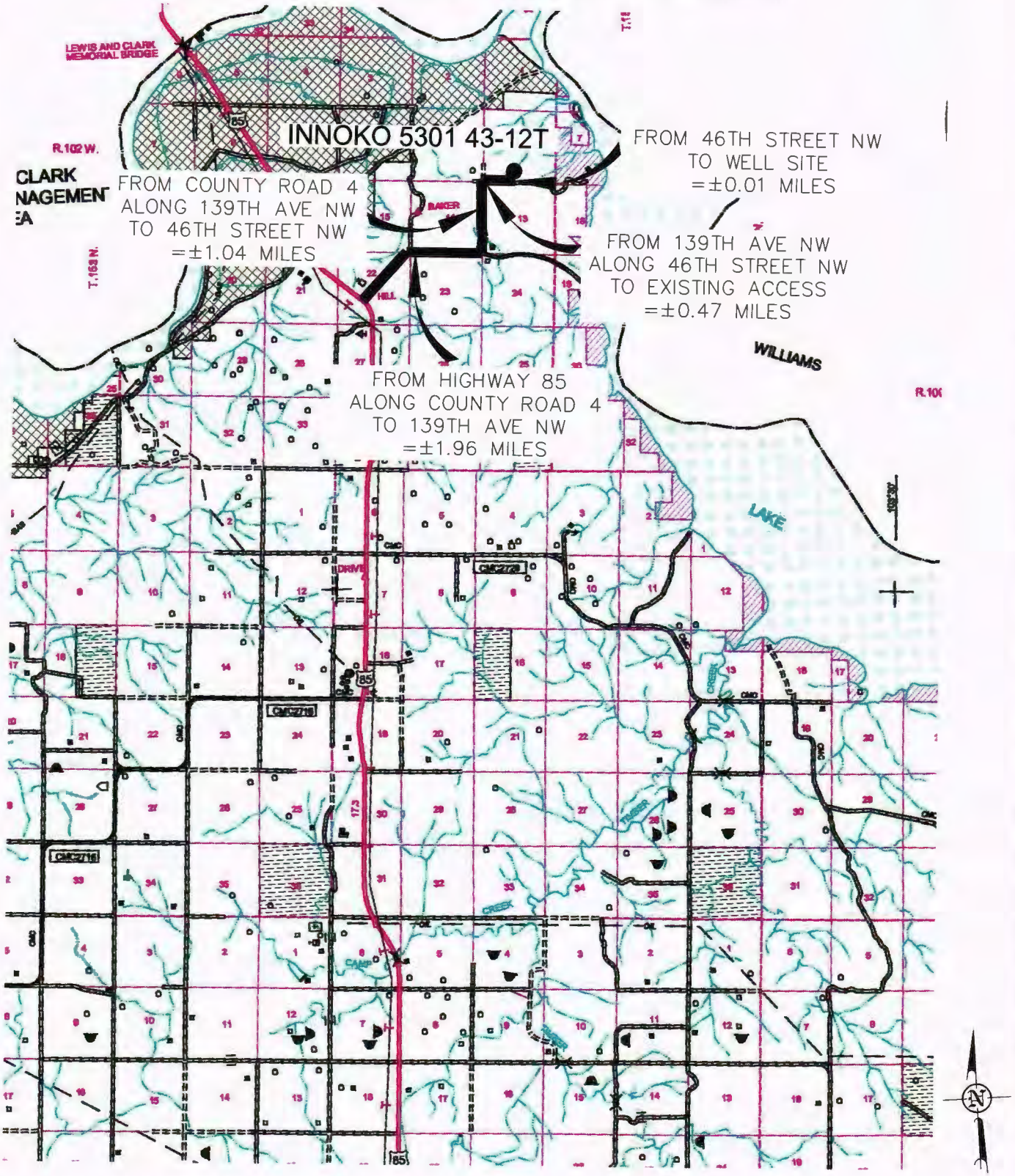
OASIS PETROLEUM NORTH AMERICA, LLC
QUAD LOCATION MAP
SECTION 12, T153N, R101W
MCKENZIE COUNTY, NORTH DAKOTA

Drawn By:	J.J.S.	Project No.:	S11-09-361
Checked By:	D.D.K.	Date:	DEC 2011

Revision No.	Date	By	Description
REV 1	1/19/12	JJS	SWAPPED WELL LOCATIONS
REV 2	2/5/13	BHH	MOVED BOTTOM HOLE / CHANGED NAME
REV 4	6/05/13	JJS	MOVED WELL 60'

COUNTY ROAD MAP

OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 1500, HOUSTON, TX 77002
"INNOKO 5301 43-12T"
250 FEET FROM SOUTH LINE AND 2350 FEET FROM EAST LINE
SECTION 12, T153N, R101W, 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 12, T153N, R101W
MCKENZIE COUNTY, NORTH DAKOTA

Drawn By: J.J.S. | Project No.: S11-09-361
Checked By: D.D.K. | Date: DEC 2011

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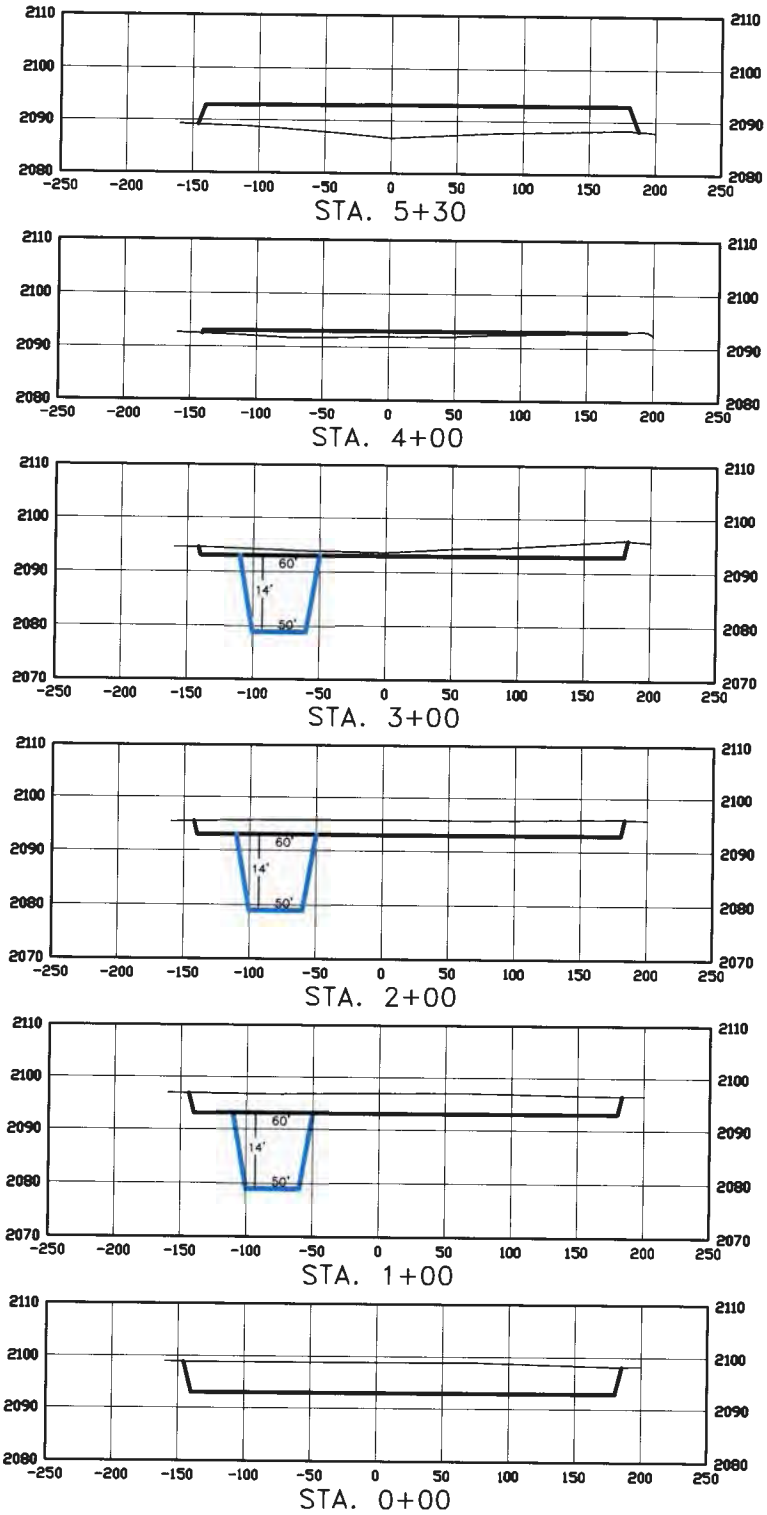
CROSS SECTIONS

OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 1500, HOUSTON, TX 77002
"INNOKO 5301 43-12T"
250 FEET FROM SOUTH LINE AND 2350 FEET FROM EAST LINE
SECTION 12, T153N, R101W, 5TH P.M., MCKENZIE COUNTY, NORTH DAKOTA



REGISTERED LAND SURVEYOR
DARYL D. KASEMAN
LS-3880
DATE: 6/05/13
NORTH DAKOTA

THIS DOCUMENT WAS ORIGINALLY ISSUED AND SEALED BY DARYL D. KASEMAN, PLS, REGISTRATION NUMBER 3880 ON 6/05/13 AND THE ORIGINAL DOCUMENTS ARE STORED AT THE OFFICES OF INTERSTATE ENGINEERING, INC.

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

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OASIS PETROLEUM NORTH AMERICA, LLC
PAD CROSS SECTIONS
SECTION 12, T153N, R101W
MCKENZIE COUNTY, NORTH DAKOTA

Drawn By: J.J.S. Project No.: S11-9-361
Checked By: D.D.K. Date: DEC 2011

Revision No.	Date	By	Description
REV 1	1/19/12	JJS	SWAPPED WELL LOCATIONS
REV 2	2/5/13	BHH	MOVED BOTTOM HOLE / CHANGED NAME
REV 4	6/05/13	JJS	MOVED WELL 60'

WELL LOCATION SITE QUANTITIES

OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 1500, HOUSTON, TX 77002
"INNOKO 5301 43-12T"
250 FEET FROM SOUTH LINE AND 2350 FEET FROM EAST LINE
SECTION 12, T153N, R101W, 5TH P.M., MCKENZIE COUNTY, NORTH DAKOTA

WELL SITE ELEVATION	2092.6
WELL PAD ELEVATION	2093.0

EXCAVATION	12,909
PLUS PIT	3,150
	16,059
EMBANKMENT	4,705
PLUS SHRINKAGE (30%)	1,412
	6,117
STOCKPILE PIT	3,150
STOCKPILE TOP SOIL (6")	3,284
STOCKPILE FROM PAD	3,508
DISTURBED AREA FROM PAD	4.07 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
2350' FEL
250' FSL

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OASIS PETROLEUM NORTH AMERICA, LLC
QUANTITIES
SECTION 12, T153N, R101W
MCKENZIE COUNTY, NORTH DAKOTA

Drawn By: J.J.S. Project No.: S11-09-361
Checked By: D.D.K. Date: DEC 2011

Revision No.	Date	By	Description
REV 1	1/19/12	JJS	SWAPPED WELL LOCATIONS
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SUNDRY NOTICES AND REPORTS ON WELLS - FORM 4

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

JUN 2013 RECEIVED ND OIL & GAS DIVISION

Well File No. 22221

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

☑ Notice of Intent — Approximate Start Date: June 18, 2013

☐ Report of Work Done — Date Work Completed:

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

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

Well Name and Number					
Innoko 5301 43-12T					
Footages	Qtr-Qtr	Section	Township	Range	
250 F S L 2350 F E L	SWSE	12	153 N	101 W	
Field	Pool	County			
Baker	Bakken	McKenzie			

24-HOUR PRODUCTION RATE

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

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

DETAILS OF WORK

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

Oasis must notify NDIC Inspector Richard Dunn 701-770-3554 with spud & TD

Company		Telephone Number
Oasis Petroleum North America LLC		(281) 404-9563
Address		
1001 Fannin, Suite 1500		
City	State	Zip Code
Houston	TX	77002
Signature: Heather McCowan	Printed Name: Heather McCowan	
Title: Regulatory Assistant	Date: June 18, 2013	
Email Address: hmccowan@oasispetroleum.com		

FOR STATE USE ONLY

☐ Received ☑ Approved

Date 06-21-2013

By

Title David Burns
Engineering Tech.

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)

MAY 2013 RECEIVED ND OIL & GAS DIVISION

Well File No. **22221**

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

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

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

Well Name and Number				
Timmons 5301 43-12B				
Footages	Qtr-Qtr	Section	Township	Range
250 F S L 2410 F E L	**SWSE**	**12**	**153 N**	**101 W**
Field	Pool	County		
Baker	**Bakken**	**McKenzie**		

24-HOUR PRODUCTION RATE

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

Name of Contractor(s)			
Address	City	State	Zip Code

DETAILS OF WORK

Oasis Petroleum North America LLC respectfully request that the permit issued for the above referenced well be reinstated.
Please apply charges to credit card on file.

$100 APD renewal cc Inv 37681 L+ 05/30/2013

Company		Telephone Number
Oasis Petroleum North America LLC		**281-404-9563**
Address		
1001 Fannin, Suite 1500		
City	State	Zip Code
Houston	**TX**	**77002**
Signature: Heather McCowan	Printed Name: **Heather McCowan**	
Title: **Regulatory Assistant**	Date: **May 9, 2013**	
Email Address: **hmccowan@oasispetroleum.com**		

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- [ ] Received
- [x] Approved

Date: 5-29-13

By: Nathaniel Erbele

Title: Petroleum Resource Specialist

SUNDRY NOTICES AND REPORTS ON WELLS - FORM 4

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

MAY 2013 RECEIVED ND OIL & GAS DIVISION

Well File No. **22221**

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

- [x] Notice of Intent — Approximate Start Date: **May 9, 2013**
- [ ] 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
- [x] Other: **Revise well plan and well name**

Well Name and Number				
Timmons 5301 43-12B				
Footages	Qtr-Qtr	Section	Township	Range
250 F S L 2410 F E L	SWSE	12	153 N	101 W
Field	Pool	County		
Baker	Bakken	McKenzie		

24-HOUR PRODUCTION RATE

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

Name of Contractor(s)			
Address	City	State	Zip Code

DETAILS OF WORK

Oasis Petroleum respectfully requests to make the following changes to the well plan for the subject well:

Intermediate casing point changed to: 220' FNL & 2555'FWL Sec. 13 T153N 101W
Casing point depth changed to: 11119' MD/ 10832' TVD
Bottom hole changed to: 250'FSL & 2640'FWL Sec. 24 T153N R101W
Total depth changed to: 21194' MD/ 10805' TVD

spacing unit changed to sections 13 & 24

Well name changed to: Innoko 5301 41-12T

Attached are revised plats, drill plan, directional plan and plot.

The following statements remain true:
Notice has been provided to the owner of any permanently occupied dwelling within 1320 feet
This well is not located within 500 feet of an occupied dwelling

B25 WNC CC

Inv 37681 05/30/2013

Company		Telephone Number
Oasis Petroleum North America LLC		**281-404-9563**
Address		
1001 Fannin, Suite 1500		
City	State	Zip Code
Houston	**TX**	**77002**
Signature: Heather McCowan	Printed Name: **Heather McCowan**	
Title: **Regulatory Assistant**	Date: **May 9, 2013**	
Email Address: **hmccowan@oasispetroleum.com**		

FOR STATE USE ONLY

- [ ] Received
- [x] Approved

Date: 5-29-13

By: Nathaniel Erbele

Title: Petroleum Resource Specialist

DRILLING PLAN

OPERATOR	Oasis Petroleum		
WELL NAME	INNOKO 5301 41-12T	**COUNTY/STATE**	McKenzie Co., ND
WELL TYPE	Horizontal Three Forks	**RIG**	Nabors B25
LOCATION	SWSW 12-153N-101W	Surface Location (survey plat): 250' fsl	2410' fwl
EST. T.D.	21,194'		
	TOTAL LATERAL: 10,075' (est)	**GROUND ELEV:** 2093 Finished Pad Elev.	**Sub Height:** 25
		KB ELEV: 2118	

PROGNOSIS: Based on 2,118' KB(est)

MARKER		DEPTH (Surf Loc)	DATUM (Surf Loc)
Pierre	NDIC MAP	2,018	100'
Greenhorn		4,646	-2,528'
Mowry		5,036	-2,918'
Dakota		5,463	-3,345'
Rierdon		6,382	-4,264'
Dunham Salt		6,899	-4,781'
Dunham Salt Base		6,976	-4,858'
Spearfish		6,986	-4,868'
Pine Salt		7,277	-5,159'
Pine Salt Base		7,333	-5,215'
Opeche Salt		7,360	-5,242'
Opeche Salt Base		7,399	-5,281'
Broom Creek (Top of Minnelusa Gp.)		7,604	-5,486'
Amsden		7,663	-5,545'
Tyler		7,852	-5,734'
Otter (Base of Minnelusa Gp.)		8,024	-5,906'
Kibbey		8,375	-6,257'
Charles Salt		8,522	-6,404'
UB		9,148	-7,030'
Base Last Salt		9,224	-7,106'
Ratcliffe		9,268	-7,150'
Mission Canyon		9,443	-7,325'
Lodgepole		10,009	-7,891'
Lodgepole Fracture Zone		10,194	-8,076'
False Bakken		10,717	-8,599'
Upper Bakken		10,726	-8,608'
Middle Bakken		10,736	-8,618'
Lower Bakken		10,777	-8,659'
Pronghorn		10,790	-8,672'
Three Forks		10,806	-8,688'
Three Forks Target Top		10,814	-8,696'
Three Forks Target Base		10,832	-8,714'
Claystone		10,834	-8,716'

Dip Rate: overall +0.09° or .16'/100' up (complex)

Max. Anticipated BHP: 4686

LOGS:

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

REQUEST LOG WAIVER Gulf Oil Lindvig 1-11-3C 3620' to the NW 153N 101W S11

DEVIATION:

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

DST'S: None planned

CORES: None planned

MUDLOGGING:

Two-Man: 8,322' ~200' above the Charles (Kibbey) to Casing point; Casing point to TD

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

BOP: 11" 5000 psi blind, pipe & annular

Surface Formation: *Glacial till*

MUD:

	Interval		Type	WT	Vis	WL	Remarks
Surface:	0' -	2,118'	FW/Gel - Lime Sweeps	8.4-9.0	28-32	NC	Circ Mud Tanks
Intermediate:	2,118' -	11,119'	Invert	9.5-10.4	40-50	30+HtHp	Circ Mud Tanks
Lateral:	11,119' -	21,194'	Salt Water	9.8-10.2	28-32	NC	Circ Mud Tanks

CASING:

	Size	Wt ppf	Hole	Depth	Cement	WOC	Remarks
Surface:	9-5/8"	36#	13-1/2"	2,118'	To Surface	12	100' into Pierre
Intermediate:	7"	32#	8-3/4"	11,119'	3,963'	24	1500' above Dakota
Production Liner:	4.5"	13.5#	6"	21,194'	TOL @ 10,305'		50' above KOP

PROBABLE PLUGS, IF REQ'D:

OTHER:

	MD	TVD	FNL/FSL	FEL/FWL	S-T-R	AZI
Surface:	2,118	2,118	250' FSL	2410' FWL	Sec. 12 T153N-R101W	Survey Company:
KOP:	10,355'	10,355'	250' FSL	2410' FWL	Sec. 12 T153N-R101W	Build Rate: 12 deg /100'
EOC:	11,106'	10,832'	208' FNL	2551' FWL	Sec. 13 T153N-R101W	90.2
Casing Point:	11,119'	10,832'	220' FNL	2555' FWL	Sec. 13 T153N-R101W	90.2
Middle Bakken Lateral TD:	21,194'	10,805'	250' FSL	2840' FWL	Sec. 24 T153N-R101W	90.2

Comments:

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

OASIS PETROLEUM

Geology: 1/0/1900 **Engineering:** S. Dunlap 4/5/13

Oasis Petroleum
Well Summary
Innoko 5301 43-12T
Section 12 T153N R101W
McKenzie County, ND

SURFACE CASING AND CEMENT DESIGN

	Interval							Make-up Torque (ft-lbs)		
Size	From	To	Weight	Grade	Coupling	I.D.	Drift	Minimum	Optimum	Max
9-5/8"	0	2118	36	J-55	LTC	8.921"	8.765"	3400	4530	5660

Interval	Description	Collapse	Burst	Tension	Cost per ft
		(psi) / a	(psi) / b	(1000 lbs) / c	
0' - 2118'	9-5/8", 36#, J-55, LTC, 8rd	2020 / 2.04	3520 / 3.55	453 / 2.73	

API Rating & Safety Factor

a) Based on full casing evacuation with 9.0 ppg fluid on backside (2118' setting depth).
b) Burst pressure based on 9 ppg fluid with no fluid on backside (2118' setting depth).
c) Based on string weight in 9.0 ppg fluid at 2118' TVD plus 100k# overpull. (Buoyed weight equals 66k 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: **437 sks** (225 bbls), 11.5 lb/gal, 2.90 cu. ft./sk Conventional Class G Cement with 4.0% BWOB Extender, 2.0% BWOB Expanding Agent, 2.0% $CaCl_2$, and 0.250 lb/sk Lost Circulation Additive

Tail Slurry: **337 sks** (70 bbls), 15.8 lb/gal, 1.16 cu. ft./sk Conventional Class G Cement with 0.25% BWOB $CaCL_2$, and 0.250 lb/sk Lost Circulation Agent

Oasis Petroleum
Well Summary
Innoko 5301 43-12T
Section 12 T153N R101W
McKenzie County, ND

INTERMEDIATE CASING AND CEMENT DESIGN

								Make-up Torque (ft-lbs)		
Size	**Interval**		**Weight**	**Grade**	**Coupling**	**I.D.**	**Drift****	**Minimum**	**Optimum**	**Max**
7"	0' –11119'		32	HCP-110	LTC	6.094"	6.000"**	6,730	8,970	9,870

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

Interval	Length	Description	Collapse	Burst	Tension	Condition
			(psi) a	(psi) b	(1000 lbs) c	
0' –11119'	3956'	7", 32#, HCP-110, LTC, 8rd	11,820 / 2.10*	12,460 / 1.19	797/2.02	New
0' –11119'	3956'	7", 32#, HCP-110, LTC, 8rd	11,820 / 1.07**	12,460 / 1.19		New

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 (from **6399**' to **10355**).
b. Burst pressure based on 9,000 psig max press for stimulation plus 10.2 ppg fluid in casing and 9.0 ppg fluid on backside—to **10832**' TVD.
c. Based on string weight in 10 ppg fluid, (**301**k 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
20 bbls CW8
20 bbls Freshwater

Lead Slurry: **184 sks** (85 bbls), 11.8 ppg, 2.59 cu. ft./sk 65:35 POZ Cement with 6% BWOB Extender, 0.15% BWOB Viscosifier, 0.8% BWOB Fluid Loss Additive, 0.2% BWOB Anti Foam, and 0.259 lb/sk Lost Circulation Additive

Tail Slurry: **563 sks** (164 bbls), 15.6 ppg, 1.64 cu. ft./sk Conventional Class G Cement with 10.0% BWOB NaCL, 35.0% BWOB Silica Flour, 0.2% BWOB Fluid Loss, 0.27% BWOB Retarder, 0.2% BWOB Anti Foam, and 0.25 lb/sk Lost Circulation Additive

Oasis Petroleum
Well Summary
Innoko 5301 43-12T
Section 12 T153N R101W
McKenzie County, ND

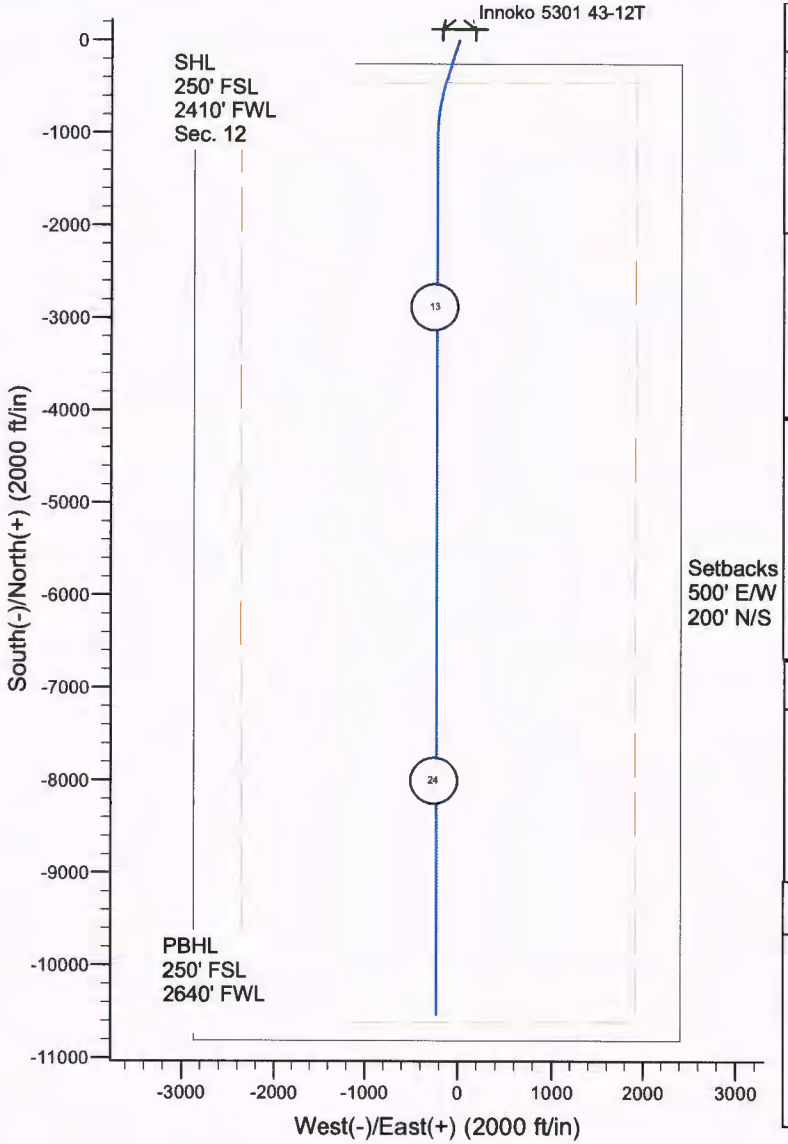
PRODUCTION LINER

							Make-up Torque (ft-lbs)		
Size	**Interval**	**Weight**	**Grade**	**Coupling**	**I.D.**	**Drift**	**Minimum**	**Optimum**	**Max**
4-1/2"	10305'-21194'	13.5	P-110	BTC	3.92"	3.795"	2,270	3,020	3,780

Interval	Length	Description	Collapse	Burst	Tension	Condition
			(psi) **a**	(psi) **b**	(1000 lbs) **c**	
10305'-21194'	10889'	4-1/2", 13.5 lb, P-110, BTC	10670 / 1.99	12410 / 1.19	422 / 2.04	New

API Rating & Safety Factor

a) Based on full casing evacuation with 9.5 ppg fluid on backside @ 10832' TVD.
b) Burst pressure based on 9,000 psi treating pressure with 10.2 ppg internal fluid gradient and 9.0 ppg external fluid gradient @ 10832' TVD.
c) Based on string weight in 9.5 ppg fluid (Buoyed weight: 107k lbs.) plus 100k lbs overpull.



Setbacks
500' E/W
200' N/S

WELL DETAILS: Innoko 5301 43-12T

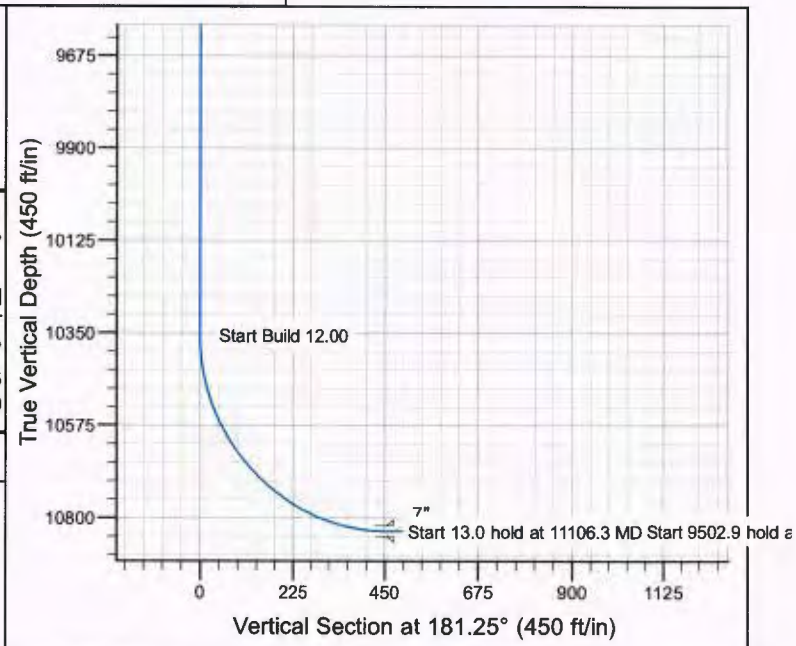
Ground Level: 2093.0

Northing	Easting	Latitude	Longitude
125076.38	368067.66	48° 4' 58.050 N	103° 36' 50.360 W

Project: Indian Hills
Site: 153N-101W-13/24
Well: Innoko 5301 43-12T
Wellbore: Innoko 5301 43-12T
Design: Design #1

Azimuths to True North
Magnetic North: 8.34°

Magnetic Field
Strength: 56589.8snT
Dip Angle: 73.02°
Date: 3/28/2013
Model: IGRF200510

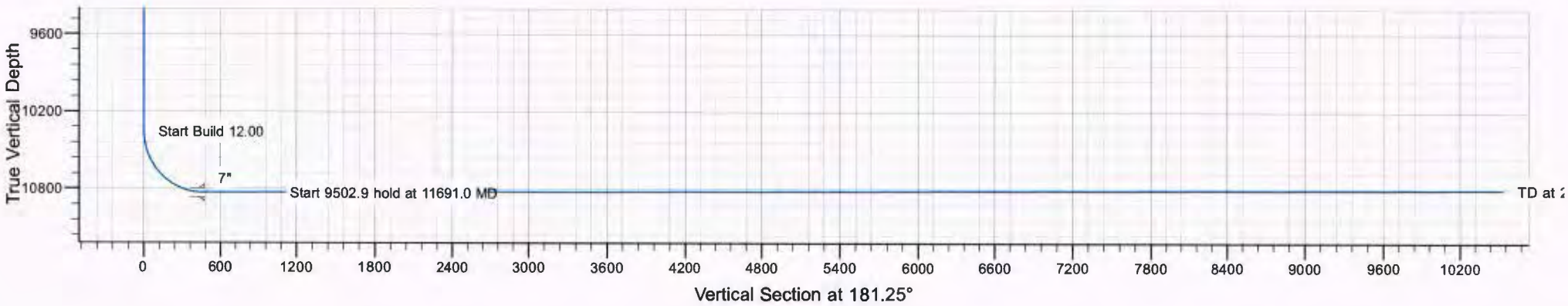


CASING DETAILS

TVD	MD	Name	Size
2018.0	2018.0	9 5/8"	9.625
10832.4	11119.0	7"	7.000

SECTION DETAILS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	
10355.0	0.00	0.00	10355.0	0.0	0.0	0.00	
11106.3	90.16	197.15	10832.5	-457.5	-141.2	12.00	
11119.3	90.16	197.15	10832.4	-469.9	-145.0	0.00	
11691.0	90.16	180.00	10830.8	-1033.1	-229.9	3.00	
21193.9	90.16	180.00	10804.5	-10536.0	-229.9	0.00	



Oasis

Indian Hills
153N-101W-13/24
Innoko 5301 43-12T

Innoko 5301 43-12T

Plan: Design #1

Standard Survey Report

08 April, 2013

Survey Report

Company:	Oasis	**Local Co-ordinate Reference:**	Well Innoko 5301 43-12T
Project:	Indian Hills	**TVD Reference:**	WELL @ 2118.0ft (Original Well Elev)
Site:	153N-101W-13/24	**MD Reference:**	WELL @ 2118.0ft (Original Well Elev)
Well:	Innoko 5301 43-12T	**North Reference:**	True
Wellbore:	Innoko 5301 43-12T	**Survey Calculation Method:**	Minimum Curvature
Design:	Design #1	**Database:**	OpenWellsCompass - EDM Prod

Project Indian Hills

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

Site 153N-101W-13/24

Site Position:		**Northing:**	125,067.66 m	**Latitude:**	48° 4' 57.960 N
From:	Lat/Long	**Easting:**	368,214.56 m	**Longitude:**	103° 36' 43.250 W
Position Uncertainty:	0.0 ft	**Slot Radius:**	13.200 in	**Grid Convergence:**	-2.32 °

Well Innoko 5301 43-12T

Well Position	**+N/-S**	0.0 ft	**Northing:**	125,076.39 m	**Latitude:**	48° 4' 58.050 N
	+E/-W	0.0 ft	**Easting:**	368,067.66 m	**Longitude:**	103° 36' 50.360 W
Position Uncertainty		0.0 ft	**Wellhead Elevation:**	ft	**Ground Level:**	2,093.0 ft

Wellbore Innoko 5301 43-12T

Magnetics	**Model Name**	**Sample Date**	**Declination (°)**	**Dip Angle (°)**	**Field Strength (nT)**
	IGRF200510	3/28/2013	8.34	73.02	56,590

Design Design #1

Audit Notes:

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

Vertical Section:	**Depth From (TVD) (ft)**	**+N/-S (ft)**	**+E/-W (ft)**	**Direction (°)**
	0.0	0.0	0.0	181.25

Survey Tool Program **Date** 4/8/2013

From (ft)	**To (ft)**	**Survey (Wellbore)**	**Tool Name**	**Description**
0.0	21,193.9	Design #1 (Innoko 5301 43-12T)	MWD	MWD - Standard

Planned Survey

Measured Depth (ft)	**Inclination (°)**	**Azimuth (°)**	**Vertical Depth (ft)**	**+N/-S (ft)**	**+E/-W (ft)**	**Vertical Section (ft)**	**Dogleg Rate (°/100ft)**	**Build Rate (°/100ft)**	**Turn Rate (°/100ft)**
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

Survey Report

Company:	Oasis	**Local Co-ordinate Reference:**	Well Innoko 5301 43-12T
Project:	Indian Hills	**TVD Reference:**	WELL @ 2118.0ft (Original Well Elev)
Site:	153N-101W-13/24	**MD Reference:**	WELL @ 2118.0ft (Original Well Elev)
Well:	Innoko 5301 43-12T	**North Reference:**	True
Wellbore:	Innoko 5301 43-12T	**Survey Calculation Method:**	Minimum Curvature
Design:	Design #1	**Database:**	OpenWellsCompass - EDM Prod

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
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
2,018.0	0.00	0.00	2,018.0	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
2,200.0	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
4,646.0	0.00	0.00	4,646.0	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
4,900.0	0.00	0.00	4,900.0	0.0	0.0	0.0	0.00	0.00	0.00

Survey Report

Company:	Oasis	**Local Co-ordinate Reference:**	Well Innoko 5301 43-12T
Project:	Indian Hills	**TVD Reference:**	WELL @ 2118.0ft (Original Well Elev)
Site:	153N-101W-13/24	**MD Reference:**	WELL @ 2118.0ft (Original Well Elev)
Well:	Innoko 5301 43-12T	**North Reference:**	True
Wellbore:	Innoko 5301 43-12T	**Survey Calculation Method:**	Minimum Curvature
Design:	Design #1	**Database:**	OpenWellsCompass - EDM Prod

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
5,000.0	0.00	0.00	5,000.0	0.0	0.0	0.0	0.00	0.00	0.00
5,036.0	0.00	0.00	5,036.0	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
5,463.0	0.00	0.00	5,463.0	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
6,382.0	0.00	0.00	6,382.0	0.0	0.0	0.0	0.00	0.00	0.00
Rierdon									
6,400.0	0.00	0.00	6,400.0	0.0	0.0	0.0	0.00	0.00	0.00
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
6,899.0	0.00	0.00	6,899.0	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
6,976.0	0.00	0.00	6,976.0	0.0	0.0	0.0	0.00	0.00	0.00
Dunham Salt Base									
6,986.0	0.00	0.00	6,986.0	0.0	0.0	0.0	0.00	0.00	0.00
Spearfish									
7,000.0	0.00	0.00	7,000.0	0.0	0.0	0.0	0.00	0.00	0.00
7,100.0	0.00	0.00	7,100.0	0.0	0.0	0.0	0.00	0.00	0.00
7,200.0	0.00	0.00	7,200.0	0.0	0.0	0.0	0.00	0.00	0.00
7,277.0	0.00	0.00	7,277.0	0.0	0.0	0.0	0.00	0.00	0.00
Pine Salt									
7,300.0	0.00	0.00	7,300.0	0.0	0.0	0.0	0.00	0.00	0.00
7,333.0	0.00	0.00	7,333.0	0.0	0.0	0.0	0.00	0.00	0.00
Pine Salt Base									
7,360.0	0.00	0.00	7,360.0	0.0	0.0	0.0	0.00	0.00	0.00
Opeche Salt									
7,399.0	0.00	0.00	7,399.0	0.0	0.0	0.0	0.00	0.00	0.00
Opeche Salt Base									

Survey Report

Company:	Oasis	**Local Co-ordinate Reference:**	Well Innoko 5301 43-12T
Project:	Indian Hills	**TVD Reference:**	WELL @ 2118.0ft (Original Well Elev)
Site:	153N-101W-13/24	**MD Reference:**	WELL @ 2118.0ft (Original Well Elev)
Well:	Innoko 5301 43-12T	**North Reference:**	True
Wellbore:	Innoko 5301 43-12T	**Survey Calculation Method:**	Minimum Curvature
Design:	Design #1	**Database:**	OpenWellsCompass - EDM Prod

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
7,400.0	0.00	0.00	7,400.0	0.0	0.0	0.0	0.00	0.00	0.00
7,500.0	0.00	0.00	7,500.0	0.0	0.0	0.0	0.00	0.00	0.00
7,600.0	0.00	0.00	7,600.0	0.0	0.0	0.0	0.00	0.00	0.00
7,604.0	0.00	0.00	7,604.0	0.0	0.0	0.0	0.00	0.00	0.00
Broom Creek (Top of Minnelusa Gp.)									
7,663.0	0.00	0.00	7,663.0	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
7,852.0	0.00	0.00	7,852.0	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
8,024.0	0.00	0.00	8,024.0	0.0	0.0	0.0	0.00	0.00	0.00
Otter (Base of Minnelusa Gp.)									
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
8,375.0	0.00	0.00	8,375.0	0.0	0.0	0.0	0.00	0.00	0.00
Kibbey									
8,400.0	0.00	0.00	8,400.0	0.0	0.0	0.0	0.00	0.00	0.00
8,500.0	0.00	0.00	8,500.0	0.0	0.0	0.0	0.00	0.00	0.00
8,522.0	0.00	0.00	8,522.0	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
9,148.0	0.00	0.00	9,148.0	0.0	0.0	0.0	0.00	0.00	0.00
UB									
9,200.0	0.00	0.00	9,200.0	0.0	0.0	0.0	0.00	0.00	0.00
9,224.0	0.00	0.00	9,224.0	0.0	0.0	0.0	0.00	0.00	0.00
Base Last Salt									
9,268.0	0.00	0.00	9,268.0	0.0	0.0	0.0	0.00	0.00	0.00
Ratcliffe									
9,300.0	0.00	0.00	9,300.0	0.0	0.0	0.0	0.00	0.00	0.00
9,400.0	0.00	0.00	9,400.0	0.0	0.0	0.0	0.00	0.00	0.00
9,443.0	0.00	0.00	9,443.0	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

Survey Report

Company:	Oasis	**Local Co-ordinate Reference:**	Well Innoko 5301 43-12T
Project:	Indian Hills	**TVD Reference:**	WELL @ 2118.0ft (Original Well Elev)
Site:	153N-101W-13/24	**MD Reference:**	WELL @ 2118.0ft (Original Well Elev)
Well:	Innoko 5301 43-12T	**North Reference:**	True
Wellbore:	Innoko 5301 43-12T	**Survey Calculation Method:**	Minimum Curvature
Design:	Design #1	**Database:**	OpenWellsCompass - EDM Prod

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
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
10,000.0	0.00	0.00	10,000.0	0.0	0.0	0.0	0.00	0.00	0.00
10,009.0	0.00	0.00	10,009.0	0.0	0.0	0.0	0.00	0.00	0.00
Lodgepole									
10,100.0	0.00	0.00	10,100.0	0.0	0.0	0.0	0.00	0.00	0.00
10,194.0	0.00	0.00	10,194.0	0.0	0.0	0.0	0.00	0.00	0.00
Lodgepole Fracture Zone									
10,200.0	0.00	0.00	10,200.0	0.0	0.0	0.0	0.00	0.00	0.00
10,300.0	0.00	0.00	10,300.0	0.0	0.0	0.0	0.00	0.00	0.00
10,355.0	0.00	0.00	10,355.0	0.0	0.0	0.0	0.00	0.00	0.00
10,400.0	5.40	197.15	10,399.9	-2.0	-0.6	2.0	12.00	12.00	0.00
10,500.0	17.40	197.15	10,497.8	-20.9	-6.4	21.0	12.00	12.00	0.00
10,600.0	29.40	197.15	10,589.4	-58.8	-18.1	59.1	12.00	12.00	0.00
10,700.0	41.40	197.15	10,670.8	-114.0	-35.2	114.7	12.00	12.00	0.00
10,717.0	43.44	197.15	10,683.3	-125.0	-38.6	125.8	12.00	12.00	0.00
False Bakken									
10,726.0	44.52	197.15	10,689.8	-130.9	-40.4	131.8	12.00	12.00	0.00
Upper Bakken									
10,736.0	45.72	197.15	10,696.8	-137.7	-42.5	138.6	12.00	12.00	0.00
Middle Bakken									
10,777.0	50.64	197.15	10,724.2	-166.9	-51.5	168.0	12.00	12.00	0.00
Lower Bakken									
10,790.0	52.20	197.15	10,732.3	-176.6	-54.5	177.8	12.00	12.00	0.00
Pronghorn									
10,800.0	53.40	197.15	10,738.3	-184.2	-56.8	185.4	12.00	12.00	0.00
10,806.0	54.12	197.15	10,741.9	-188.8	-58.3	190.1	12.00	12.00	0.00
Three Forks									
10,900.0	65.40	197.15	10,789.1	-266.3	-82.2	268.0	12.00	12.00	0.00
11,000.0	77.40	197.15	10,821.0	-356.7	-110.1	359.0	12.00	12.00	0.00
11,100.0	89.40	197.15	10,832.4	-451.5	-139.3	454.4	12.00	12.00	0.00
11,106.3	90.16	197.15	10,832.5	-457.5	-141.2	460.5	12.00	12.00	0.00
11,119.3	90.16	197.15	10,832.4	-469.9	-145.0	473.0	0.00	0.00	0.00
11,200.0	90.16	194.73	10,832.2	-547.5	-167.2	551.0	3.00	0.00	-3.00
11,300.0	90.16	191.73	10,831.9	-644.8	-190.1	648.8	3.00	0.00	-3.00
11,400.0	90.16	188.73	10,831.6	-743.2	-207.8	747.6	3.00	0.00	-3.00
11,500.0	90.16	185.73	10,831.4	-842.4	-220.4	847.0	3.00	0.00	-3.00
11,600.0	90.16	182.73	10,831.1	-942.1	-227.8	946.9	3.00	0.00	-3.00
11,691.0	90.16	180.00	10,830.8	-1,033.1	-229.9	1,037.9	3.00	0.00	-3.00
11,700.0	90.16	180.00	10,830.8	-1,042.1	-229.9	1,046.9	0.00	0.00	0.00
11,800.0	90.16	180.00	10,830.5	-1,142.1	-229.9	1,146.8	0.00	0.00	0.00
11,900.0	90.16	180.00	10,830.2	-1,242.1	-229.9	1,246.8	0.00	0.00	0.00
12,000.0	90.16	180.00	10,830.0	-1,342.1	-229.9	1,346.8	0.00	0.00	0.00
12,100.0	90.16	180.00	10,829.7	-1,442.1	-229.9	1,446.8	0.00	0.00	0.00
12,200.0	90.16	180.00	10,829.4	-1,542.1	-229.9	1,546.7	0.00	0.00	0.00

Company:	Oasis	**Local Co-ordinate Reference:**	Well Innoko 5301 43-12T
Project:	Indian Hills	**TVD Reference:**	WELL @ 2118.0ft (Original Well Elev)
Site:	153N-101W-13/24	**MD Reference:**	WELL @ 2118.0ft (Original Well Elev)
Well:	Innoko 5301 43-12T	**North Reference:**	True
Wellbore:	Innoko 5301 43-12T	**Survey Calculation Method:**	Minimum Curvature
Design:	Design #1	**Database:**	OpenWellsCompass - EDM Prod

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
12,300.0	90.16	180.00	10,829.1	-1,642.1	-229.9	1,646.7	0.00	0.00	0.00
12,400.0	90.16	180.00	10,828.9	-1,742.1	-229.9	1,746.7	0.00	0.00	0.00
12,500.0	90.16	180.00	10,828.6	-1,842.1	-229.9	1,846.7	0.00	0.00	0.00
12,600.0	90.16	180.00	10,828.3	-1,942.1	-229.9	1,946.6	0.00	0.00	0.00
12,700.0	90.16	180.00	10,828.0	-2,042.1	-229.9	2,046.6	0.00	0.00	0.00
12,800.0	90.16	180.00	10,827.8	-2,142.1	-229.9	2,146.6	0.00	0.00	0.00
12,900.0	90.16	180.00	10,827.5	-2,242.1	-229.9	2,246.6	0.00	0.00	0.00
13,000.0	90.16	180.00	10,827.2	-2,342.1	-229.9	2,346.6	0.00	0.00	0.00
13,100.0	90.16	180.00	10,828.9	-2,442.1	-229.9	2,446.5	0.00	0.00	0.00
13,200.0	90.16	180.00	10,826.6	-2,542.1	-229.9	2,546.5	0.00	0.00	0.00
13,300.0	90.16	180.00	10,828.4	-2,642.1	-229.9	2,646.5	0.00	0.00	0.00
13,400.0	90.16	180.00	10,826.1	-2,742.1	-229.9	2,746.5	0.00	0.00	0.00
13,500.0	90.16	180.00	10,825.8	-2,842.1	-229.9	2,846.4	0.00	0.00	0.00
13,600.0	90.16	180.00	10,825.5	-2,942.1	-229.9	2,946.4	0.00	0.00	0.00
13,700.0	90.16	180.00	10,825.3	-3,042.1	-229.9	3,046.4	0.00	0.00	0.00
13,800.0	90.16	180.00	10,825.0	-3,142.1	-229.9	3,146.4	0.00	0.00	0.00
13,900.0	90.16	180.00	10,824.7	-3,242.1	-229.9	3,246.3	0.00	0.00	0.00
14,000.0	90.16	180.00	10,824.4	-3,342.1	-229.9	3,346.3	0.00	0.00	0.00
14,100.0	90.16	180.00	10,824.1	-3,442.1	-229.9	3,446.3	0.00	0.00	0.00
14,200.0	90.16	180.00	10,823.9	-3,542.1	-229.9	3,546.3	0.00	0.00	0.00
14,300.0	90.16	180.00	10,823.6	-3,642.1	-229.9	3,646.2	0.00	0.00	0.00
14,400.0	90.16	180.00	10,823.3	-3,742.1	-229.9	3,746.2	0.00	0.00	0.00
14,500.0	90.16	180.00	10,823.0	-3,842.1	-229.9	3,846.2	0.00	0.00	0.00
14,600.0	90.16	180.00	10,822.8	-3,942.1	-229.9	3,946.2	0.00	0.00	0.00
14,700.0	90.16	180.00	10,822.5	-4,042.1	-229.9	4,046.1	0.00	0.00	0.00
14,800.0	90.16	180.00	10,822.2	-4,142.1	-229.9	4,146.1	0.00	0.00	0.00
14,900.0	90.16	180.00	10,821.9	-4,242.1	-229.9	4,246.1	0.00	0.00	0.00
15,000.0	90.16	180.00	10,821.7	-4,342.1	-229.9	4,346.1	0.00	0.00	0.00
15,100.0	90.16	180.00	10,821.4	-4,442.1	-229.9	4,446.0	0.00	0.00	0.00
15,200.0	90.16	180.00	10,821.1	-4,542.1	-229.9	4,546.0	0.00	0.00	0.00
15,300.0	90.16	180.00	10,820.8	-4,642.1	-229.9	4,646.0	0.00	0.00	0.00
15,400.0	90.16	180.00	10,820.5	-4,742.1	-229.9	4,746.0	0.00	0.00	0.00
15,500.0	90.16	180.00	10,820.3	-4,842.1	-229.9	4,845.9	0.00	0.00	0.00
15,600.0	90.16	180.00	10,820.0	-4,942.1	-229.9	4,945.9	0.00	0.00	0.00
15,700.0	90.16	180.00	10,819.7	-5,042.1	-229.9	5,045.9	0.00	0.00	0.00
15,800.0	90.16	180.00	10,819.4	-5,142.1	-229.9	5,145.9	0.00	0.00	0.00
15,900.0	90.16	180.00	10,819.2	-5,242.1	-229.9	5,245.8	0.00	0.00	0.00
16,000.0	90.16	180.00	10,818.9	-5,342.1	-229.9	5,345.8	0.00	0.00	0.00
16,100.0	90.16	180.00	10,818.6	-5,442.1	-229.9	5,445.8	0.00	0.00	0.00
16,200.0	90.16	180.00	10,818.3	-5,542.1	-229.9	5,545.8	0.00	0.00	0.00
16,300.0	90.16	180.00	10,818.1	-5,642.1	-229.9	5,645.8	0.00	0.00	0.00
16,400.0	90.16	180.00	10,817.8	-5,742.1	-229.9	5,745.7	0.00	0.00	0.00
16,500.0	90.16	180.00	10,817.5	-5,842.1	-229.9	5,845.7	0.00	0.00	0.00

Survey Report

Company:	Oasis	**Local Co-ordinate Reference:**	Well Innoko 5301 43-12T
Project:	Indian Hills	**TVD Reference:**	WELL @ 2118.0ft (Original Well Elev)
Site:	153N-101W-13/24	**MD Reference:**	WELL @ 2118.0ft (Original Well Elev)
Well:	Innoko 5301 43-12T	**North Reference:**	True
Wellbore:	Innoko 5301 43-12T	**Survey Calculation Method:**	Minimum Curvature
Design:	Design #1	**Database:**	OpenWellsCompass - EDM Prod

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
16,600.0	90.16	180.00	10,817.2	-5,942.1	-229.9	5,945.7	0.00	0.00	0.00
16,700.0	90.16	180.00	10,816.9	-6,042.1	-229.9	6,045.7	0.00	0.00	0.00
16,800.0	90.16	180.00	10,816.7	-6,142.1	-229.9	6,145.6	0.00	0.00	0.00
16,900.0	90.16	180.00	10,816.4	-6,242.1	-229.9	6,245.6	0.00	0.00	0.00
17,000.0	90.16	180.00	10,816.1	-6,342.1	-229.9	6,345.6	0.00	0.00	0.00
17,100.0	90.16	180.00	10,815.8	-6,442.1	-229.9	6,445.6	0.00	0.00	0.00
17,200.0	90.16	180.00	10,815.6	-6,542.1	-229.9	6,545.5	0.00	0.00	0.00
17,300.0	90.16	180.00	10,815.3	-6,642.1	-229.9	6,645.5	0.00	0.00	0.00
17,400.0	90.16	180.00	10,815.0	-6,742.1	-229.9	6,745.5	0.00	0.00	0.00
17,500.0	90.16	180.00	10,814.7	-6,842.1	-229.9	6,845.5	0.00	0.00	0.00
17,600.0	90.16	180.00	10,814.4	-6,942.1	-229.9	6,945.4	0.00	0.00	0.00
17,700.0	90.16	180.00	10,814.2	-7,042.1	-229.9	7,045.4	0.00	0.00	0.00
17,800.0	90.16	180.00	10,813.9	-7,142.1	-229.9	7,145.4	0.00	0.00	0.00
17,900.0	90.16	180.00	10,813.6	-7,242.1	-229.9	7,245.4	0.00	0.00	0.00
18,000.0	90.16	180.00	10,813.3	-7,342.1	-229.9	7,345.3	0.00	0.00	0.00
18,100.0	90.16	180.00	10,813.1	-7,442.1	-229.9	7,445.3	0.00	0.00	0.00
18,200.0	90.16	180.00	10,812.8	-7,542.1	-229.9	7,545.3	0.00	0.00	0.00
18,300.0	90.16	180.00	10,812.5	-7,642.1	-229.9	7,645.3	0.00	0.00	0.00
18,400.0	90.16	180.00	10,812.2	-7,742.1	-229.9	7,745.2	0.00	0.00	0.00
18,500.0	90.16	180.00	10,812.0	-7,842.1	-229.9	7,845.2	0.00	0.00	0.00
18,600.0	90.16	180.00	10,811.7	-7,942.1	-229.9	7,945.2	0.00	0.00	0.00
18,700.0	90.16	180.00	10,811.4	-8,042.1	-229.9	8,045.2	0.00	0.00	0.00
18,800.0	90.16	180.00	10,811.1	-8,142.1	-229.9	8,145.1	0.00	0.00	0.00
18,900.0	90.16	180.00	10,810.8	-8,242.1	-229.9	8,245.1	0.00	0.00	0.00
19,000.0	90.16	180.00	10,810.6	-8,342.1	-229.9	8,345.1	0.00	0.00	0.00
19,100.0	90.16	180.00	10,810.3	-8,442.1	-229.9	8,445.1	0.00	0.00	0.00
19,200.0	90.16	180.00	10,810.0	-8,542.1	-229.9	8,545.1	0.00	0.00	0.00
19,300.0	90.16	180.00	10,809.7	-8,642.1	-229.9	8,645.0	0.00	0.00	0.00
19,400.0	90.16	180.00	10,809.5	-8,742.1	-229.9	8,745.0	0.00	0.00	0.00
19,500.0	90.16	180.00	10,809.2	-8,842.1	-229.9	8,845.0	0.00	0.00	0.00
19,600.0	90.16	180.00	10,808.9	-8,942.1	-229.9	8,945.0	0.00	0.00	0.00
19,700.0	90.16	180.00	10,808.6	-9,042.1	-229.9	9,044.9	0.00	0.00	0.00
19,800.0	90.16	180.00	10,808.4	-9,142.1	-229.9	9,144.9	0.00	0.00	0.00
19,900.0	90.16	180.00	10,808.1	-9,242.1	-229.9	9,244.9	0.00	0.00	0.00
20,000.0	90.16	180.00	10,807.8	-9,342.1	-229.9	9,344.9	0.00	0.00	0.00
20,100.0	90.16	180.00	10,807.5	-9,442.1	-229.9	9,444.8	0.00	0.00	0.00
20,200.0	90.16	180.00	10,807.2	-9,542.1	-229.9	9,544.8	0.00	0.00	0.00
20,300.0	90.16	180.00	10,807.0	-9,642.1	-229.9	9,644.8	0.00	0.00	0.00
20,400.0	90.16	180.00	10,806.7	-9,742.1	-229.9	9,744.8	0.00	0.00	0.00
20,500.0	90.16	180.00	10,806.4	-9,842.1	-229.9	9,844.7	0.00	0.00	0.00
20,600.0	90.16	180.00	10,806.1	-9,942.1	-229.9	9,944.7	0.00	0.00	0.00
20,700.0	90.16	180.00	10,805.9	-10,042.1	-229.9	10,044.7	0.00	0.00	0.00
20,800.0	90.16	180.00	10,805.6	-10,142.1	-229.9	10,144.7	0.00	0.00	0.00
20,900.0	90.16	180.00	10,805.3	-10,242.1	-229.9	10,244.6	0.00	0.00	0.00

Survey Report

Company:	Oasis	**Local Co-ordinate Reference:**	Well Innoko 5301 43-12T
Project:	Indian Hills	**TVD Reference:**	WELL @ 2118.0ft (Original Well Elev)
Site:	153N-101W-13/24	**MD Reference:**	WELL @ 2118.0ft (Original Well Elev)
Well:	Innoko 5301 43-12T	**North Reference:**	True
Wellbore:	Innoko 5301 43-12T	**Survey Calculation Method:**	Minimum Curvature
Design:	Design #1	**Database:**	OpenWellsCompass - EDM Prod

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
21,193.9	90.16	180.00	10,804.5	-10,536.0	-229.9	10,538.5	0.00	0.00	0.00

Casing Points

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (in)	Hole Diameter (in)
2,018.0	2,018.0	9 5/8"	9.625	13.500
11,119.0	10,832.4	7"	7.000	8.750

Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
2,018.0	2,018.0	Pierre			
4,646.0	4,646.0	Greenhorn			
5,036.0	5,036.0	Mowry			
5,463.0	5,463.0	Dakota			
6,382.0	6,382.0	Rierdon			
6,899.0	6,899.0	Dunham Salt			
6,976.0	6,976.0	Dunham Salt Base			
6,986.0	6,986.0	Spearfish			
7,277.0	7,277.0	Pine Salt			
7,333.0	7,333.0	Pine Salt Base			
7,360.0	7,360.0	Opeche Salt			
7,399.0	7,399.0	Opeche Salt Base			
7,604.0	7,604.0	Broom Creek (Top of Minnelusa Gp.)			
7,663.0	7,663.0	Amsden			
7,852.0	7,852.0	Tyler			
8,024.0	8,024.0	Otter (Base of Minnelusa Gp.)			
8,375.0	8,375.0	Kibbey			
8,522.0	8,522.0	Charles Salt			
9,148.0	9,148.0	UB			
9,224.0	9,224.0	Base Last Salt			
9,268.0	9,268.0	Ratcliffe			
9,443.0	9,443.0	Mission Canyon			
10,009.0	10,009.0	Lodgepole			
10,194.0	10,194.0	Lodgepole Fracture Zone			
10,717.0	10,683.3	False Bakken			
10,726.0	10,689.8	Upper Bakken			
10,736.0	10,696.8	Middle Bakken			
10,777.0	10,724.2	Lower Bakken			
10,790.0	10,732.3	Pronghorn			
10,806.0	10,741.9	Three Forks			

Survey Report

Company:	Oasis	**Local Co-ordinate Reference:**	Well Innoko 5301 43-12T
Project:	Indian Hills	**TVD Reference:**	WELL @ 2118.0ft (Original Well Elev)
Site:	153N-101W-13/24	**MD Reference:**	WELL @ 2118.0ft (Original Well Elev)
Well:	Innoko 5301 43-12T	**North Reference:**	True
Wellbore:	Innoko 5301 43-12T	**Survey Calculation Method:**	Minimum Curvature
Design:	Design #1	**Database:**	OpenWellsCompass - EDM Prod

Checked By: _____ Approved By: _____ Date: _____

WELL LOCATION PLAT

OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 1500 HOUSTON, TX 77002
"INNOKO 5301 43-12T"
250 FEET FROM SOUTH LINE AND 2410 FEET FROM EAST LINE
SECTION 12, T153N, R101W, 5TH P.M., MCKENZIE COUNTY, NORTH DAKOTA

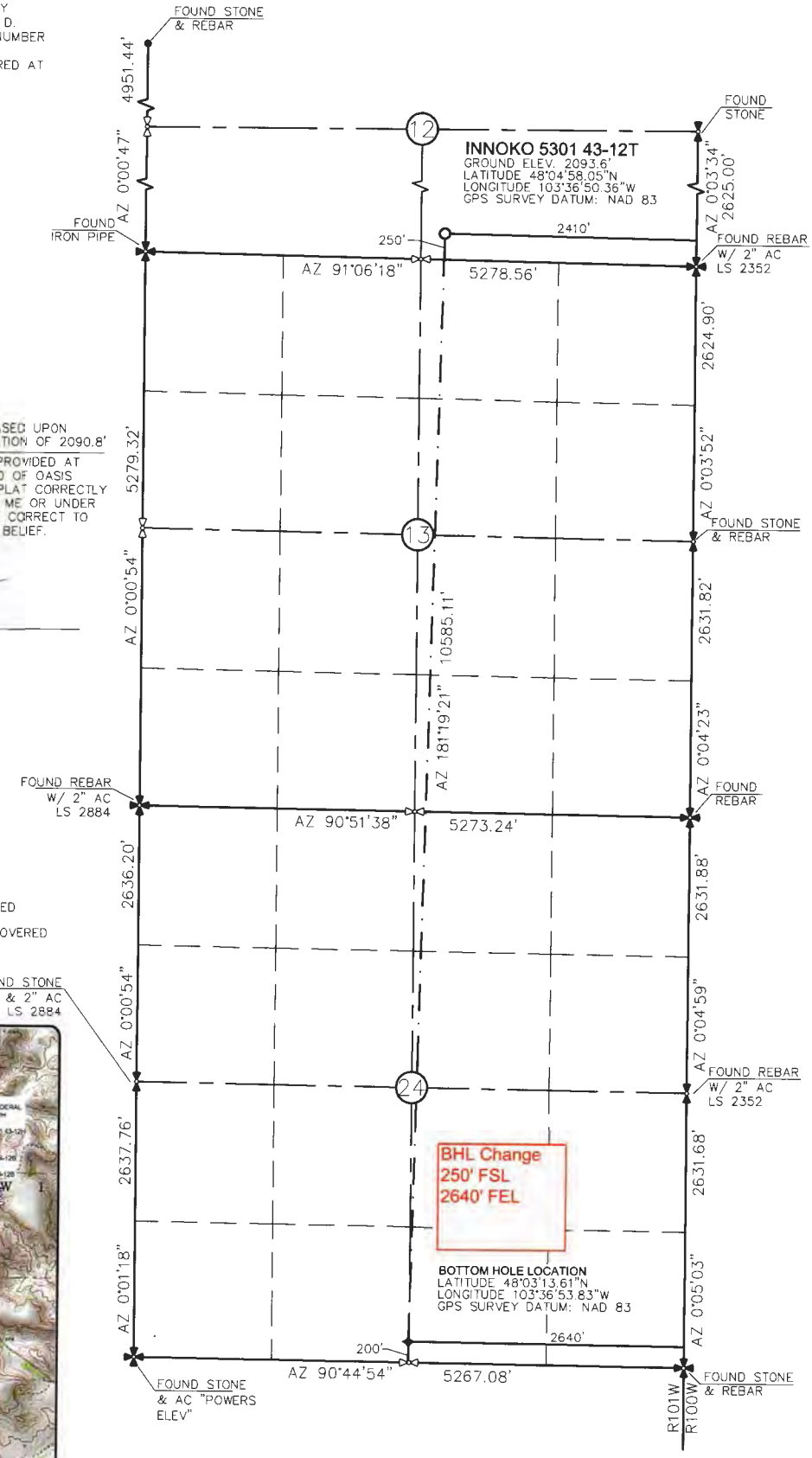
THIS DOCUMENT WAS ORIGINALLY ISSUED AND SEALED BY DARYL D. KASEMAN, PLS, REGISTRATION NUMBER 3880 ON 2/14/13 AND THE ORIGINAL DOCUMENTS ARE STORED AT THE OFFICES OF INTERSTATE ENGINEERING, INC.

REGISTERED LAND SURVEYOR
MW KADRMAS
LS-3498
DATE: 2/14/13
NORTH DAKOTA

STAKED ON 12/6/11
VERTICAL CONTROL DATUM WAS BASED UPON CONTROL POINT 13 WITH AN ELEVATION OF 2090.8'

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

MARK W. KADRMAS LS-3498



0 1000
1" = 1000'

MONUMENT – RECOVERED
MONUMENT – NOT RECOVERED

VICINITY MAP

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Fax (406) 433-5618
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Other offices in Minnesota, North Dakota and South Dakota

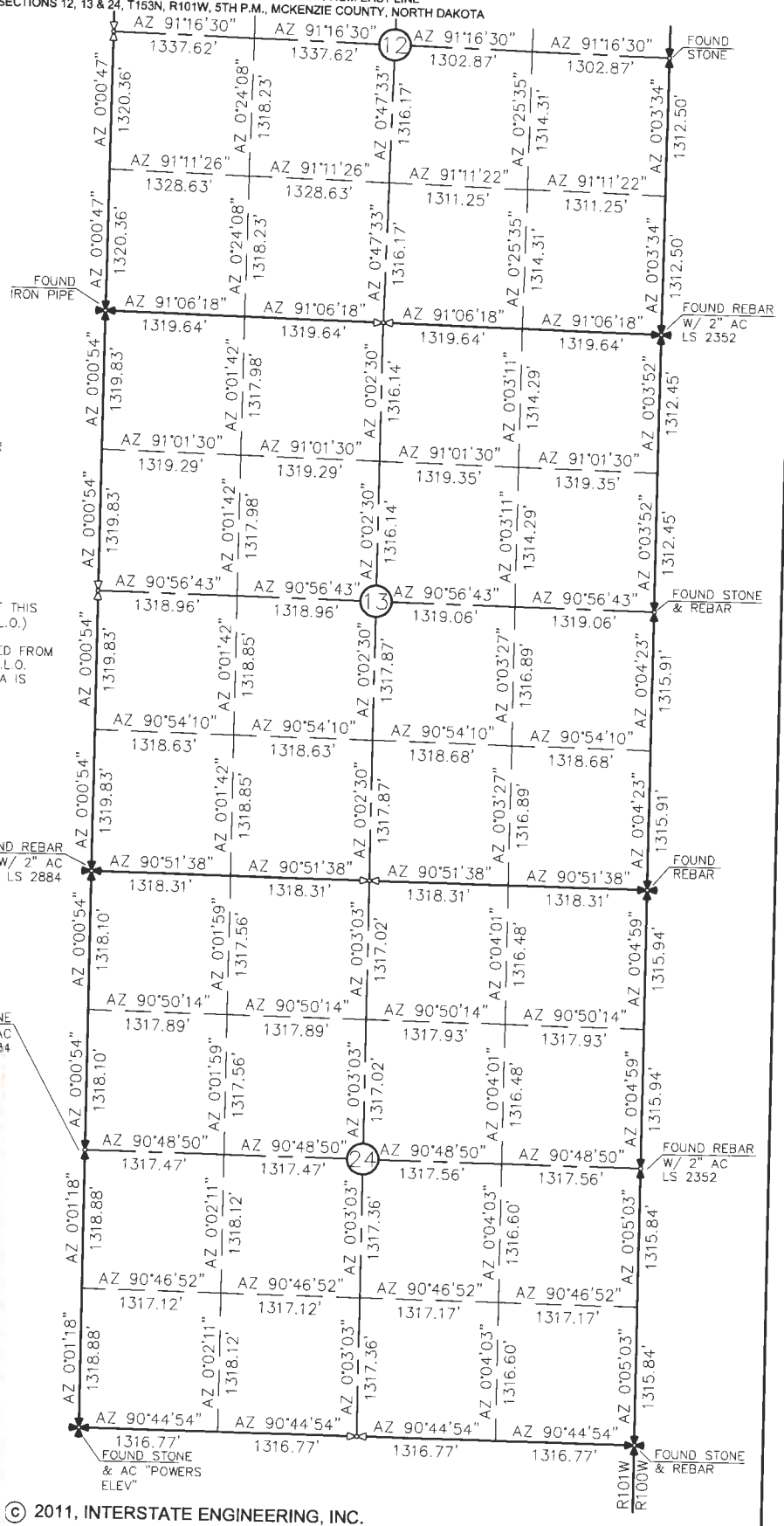
OASIS PETROLEUM NORTH AMERICA, LLC
WELL LOCATION PLAT
SECTION 12, T153N, R101W
MCKENZIE COUNTY, NORTH DAKOTA

Drawn By: J.J.S. | Project No.: S11-09-361
Checked By: D.D.K. | Date: DEC 2011

Revision No.	Date	By	Description
REV 1	1/19/12	JJS	SWAPPED WELL LOCATIONS
REV 2	2/5/13	BHH	MOVED BOTTOM HOLE / CHANGED NAME
REV 3	2/14/13	JJS	REVISED WELL CALL

SECTION BREAKDOWN

OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 1500 HOUSTON, TX 77002
"INNOKO 5301 43-12T"
250 FEET FROM SOUTH LINE AND 2410 FEET FROM EAST LINE
SECTIONS 12, 13 & 24, T153N, R101W, 5TH P.M., MCKENZIE COUNTY, NORTH DAKOTA



DARYL D. KASEMAN LS-3880 DATE: 2/06/13 REGISTERED LAND SURVEYOR NORTH DAKOTA

THIS DOCUMENT WAS ORIGINALLY ISSUED AND SEALED BY DARYL D. KASEMAN, PLS, REGISTRATION NUMBER 3880 ON 2/06/13 AND THE ORIGINAL DOCUMENTS ARE STORED AT THE OFFICES OF INTERSTATE ENGINEERING, INC.

ALL AZIMUTHS ARE BASED ON G.P.S. OBSERVATIONS. THE ORIGINAL SURVEY OF THIS AREA FOR THE GENERAL LAND OFFICE (G.L.O.) WAS 1900. 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'

0 1000
1" = 1000'

– MONUMENT – RECOVERED
– MONUMENT – NOT RECOVERED

VICINITY MAP

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OASIS PETROLEUM NORTH AMERICA, LLC
SECTION BREAKDOWN
SECTIONS 12, 13 & 24, T153N, R101W
MCKENZIE COUNTY, NORTH DAKOTA

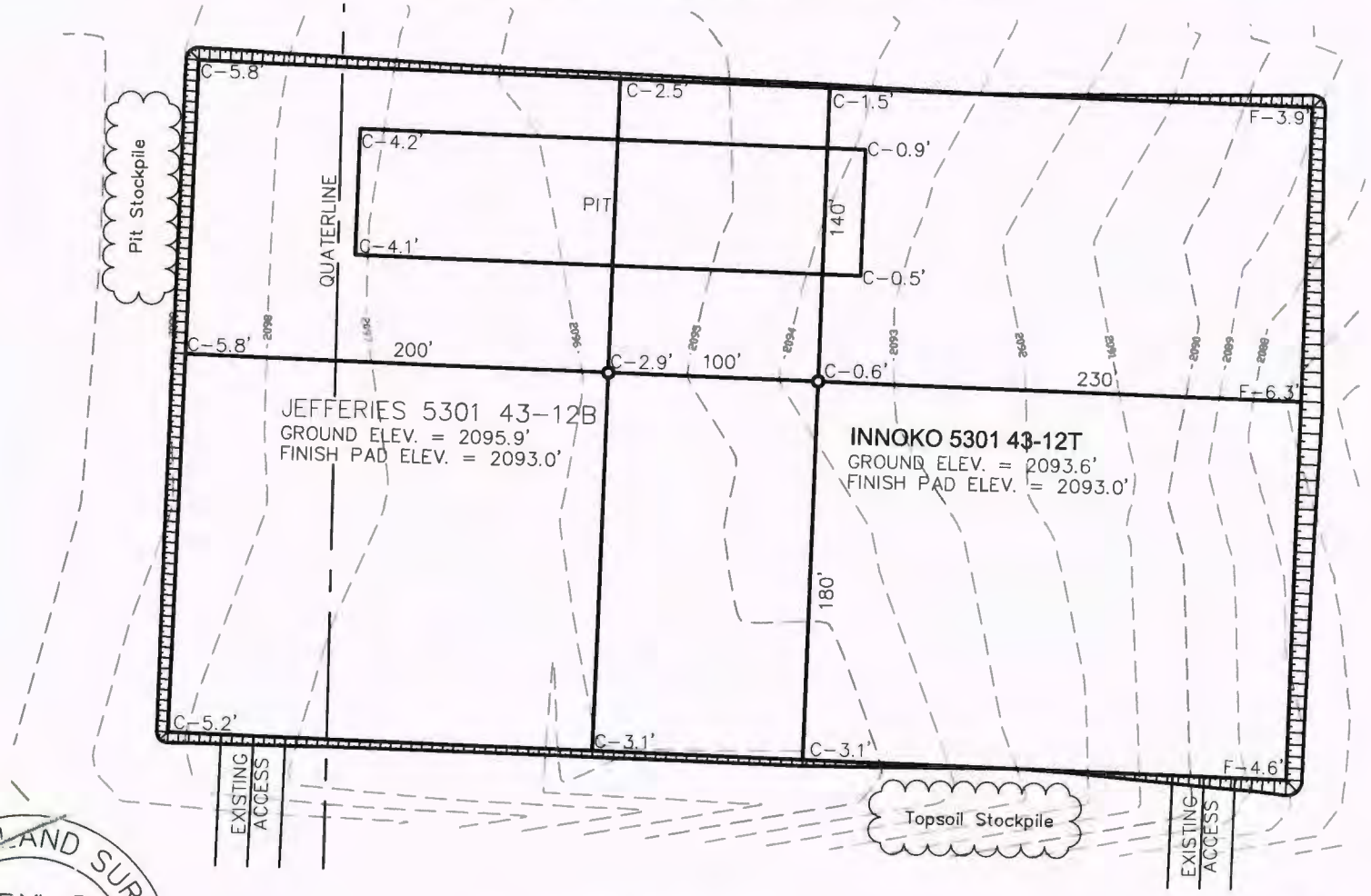
Drawn By: J.J.S. | Project No.: S11-09-381
Checked By: D.D.K. | Date: DEC 2011

Revision No.	Date	By	Description
REV 1	1/19/12	JJS	SWAPPED WELL LOCATIONS
REV 2	2/5/13	BHN	MOVED BOTTOM HOLE / CHANGED NAME

G:\SURVEY\11-09-381\ Oasis Petroleum - 2 Wells Sec 1 - 12 - 13 & 24 - T153R R101W\CAD\Innoko.dwg - 2/6/2013 4:43 PM bhn adminserv

PAD LAYOUT

OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 1500 HOUSTON, TX 77002
"INNOKO 5301 43-12T"
250 FEET FROM SOUTH LINE AND 2410 FEET FROM EAST LINE
SECTION 12, T153N, R101W, 5TH P.M., MCKENZIE COUNTY, NORTH DAKOTA



REGISTERED LAND SURVEYOR
DARYL D. KASEMAN
LS-3880
DATE: 2/06/13
NORTH DAKOTA

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

0 80
1" = 80'

Revision No.	Date	By	Description
REV 1	1/19/12	JJS	SWAPPED WELL LOCATIONS
REV 2	2/5/13	BHW	MOVED BOTTOM HOLE / CHANGED NAME

OASIS PETROLEUM NORTH AMERICA, LLC
PAD LAYOUT
SECTION 12, T153N, R101W
MCKENZIE COUNTY, NORTH DAKOTA

Drawn By: J.J.S. Project No.: S11-9-361
Checked By: D.D.K. Date: DEC 2011

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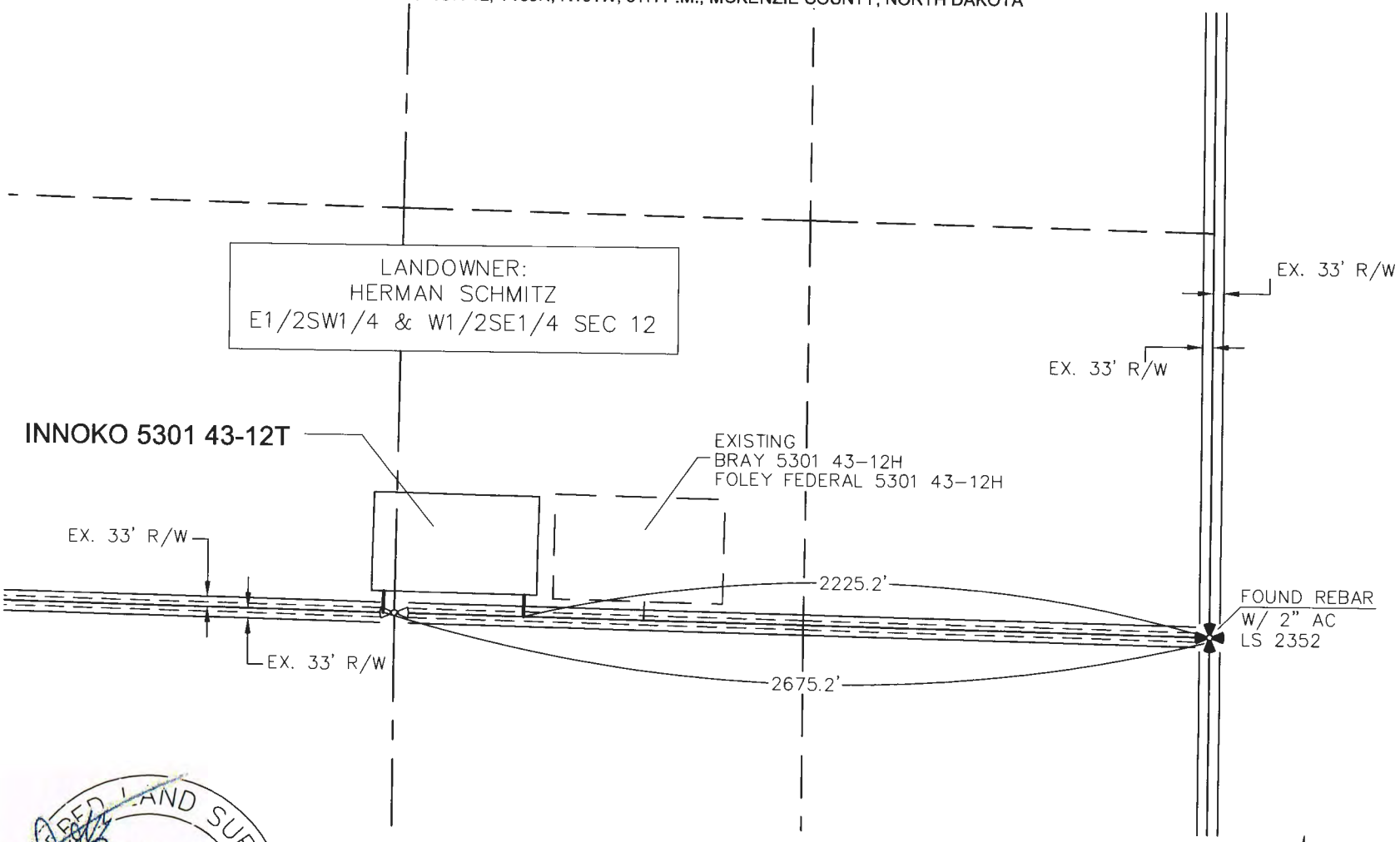
ACCESS APPROACH

OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 1500 HOUSTON, TX 77002
"INNOKO 5301 43-12T"
250 FEET FROM SOUTH LINE AND 2410 FEET FROM EAST LINE
SECTION 12, T153N, R101W, 5TH P.M., MCKENZIE COUNTY, NORTH DAKOTA



REGISTERED LAND SURVEYOR
DARYL D. KASEMAN
LS-3880
DATE: 2/06/13
NORTH DAKOTA

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0 500
1" = 500'

Revision No.	Date	By	Description
REV 1	1/18/12	JJS	SWAPPED WELL LOCATIONS
REV 2	2/5/13	BHH	MOVED BOTTOM HOLE / CHANGED NAME

OASIS PETROLEUM NORTH AMERICA, LLC
ACCESS APPROACH
SECTION 12, T153N, R101W
MCKENZIE COUNTY, NORTH DAKOTA

Drawn By: J.J.S. Project No.: S11-09-361
Checked By: D.D.K. Date: DEC 2011

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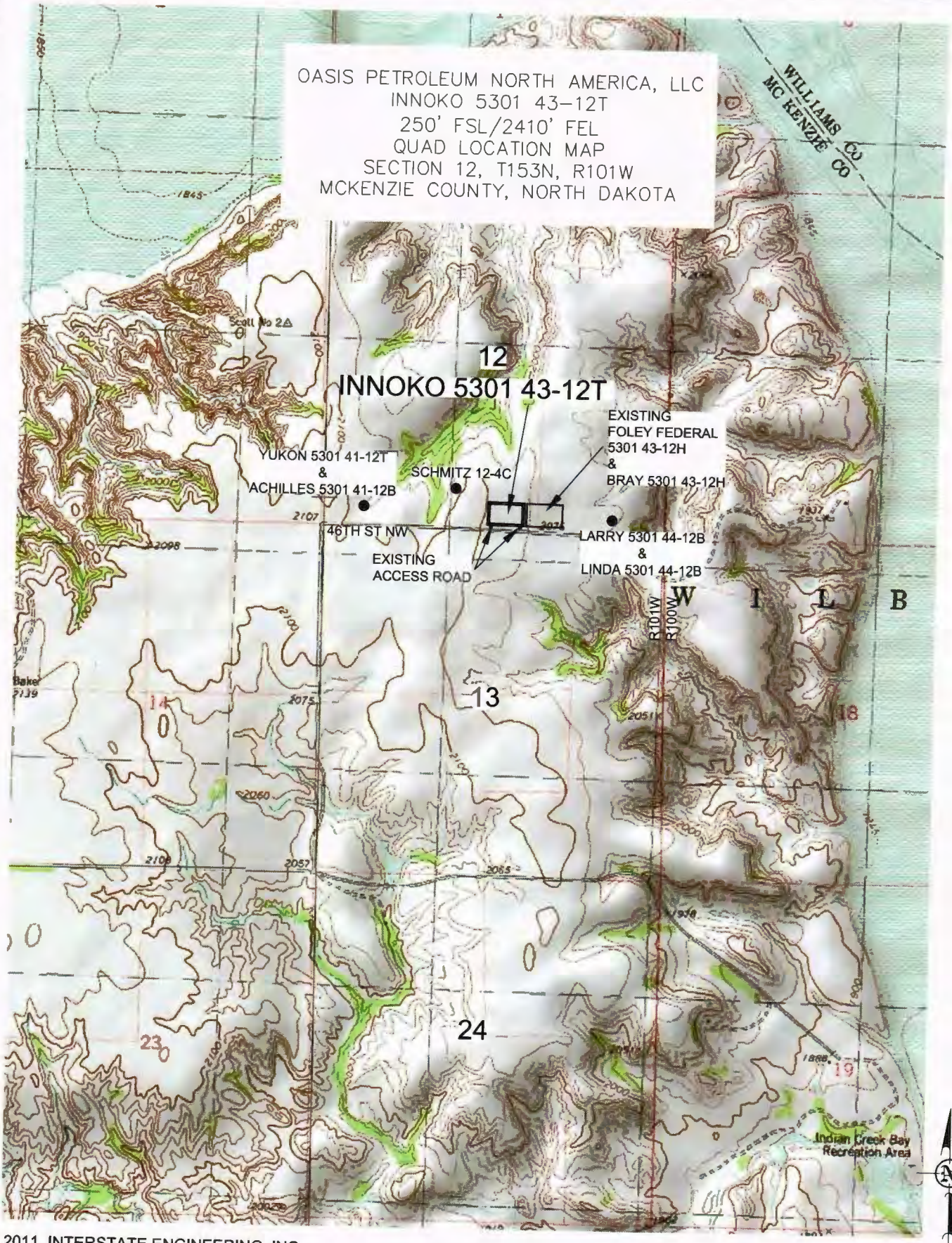

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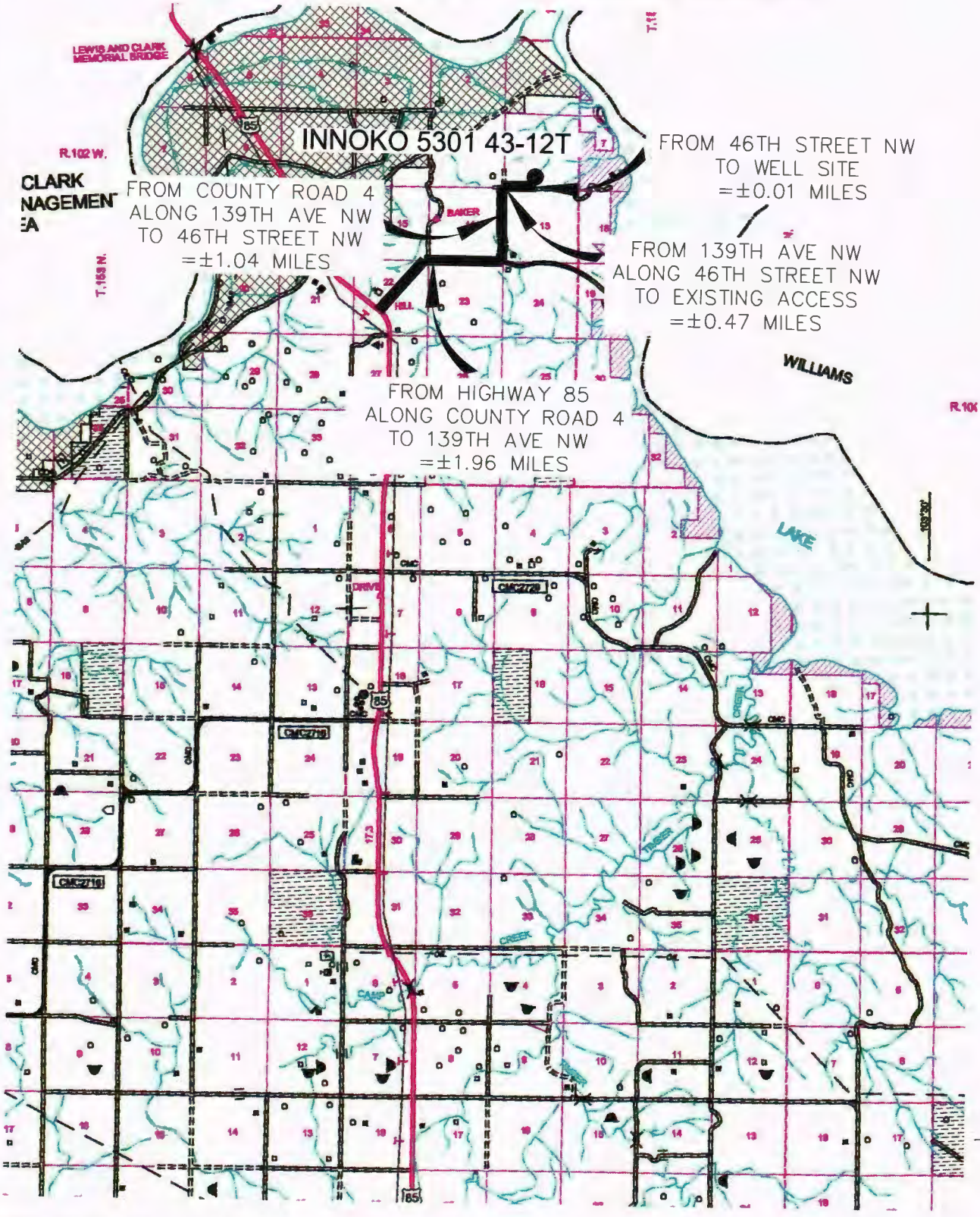
OASIS PETROLEUM NORTH AMERICA, LLC
QUAD LOCATION MAP
SECTION 12, T153N, R101W
MCKENZIE COUNTY, NORTH DAKOTA

Drawn By: J.J.S. | Project No.: S11-09-361
Checked By: D.D.K. | Date: DEC 2011

Revision No.	Date	By	Description
REV 1	1/19/12	JJS	SWAPPED WELL LOCATIONS
REV 2	2/5/13	BHH	MOVED BOTTOM HOLE / CHANGED NAME

COUNTY ROAD MAP

OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 1500 HOUSTON, TX 77002
"INNOKO 5301 43-12T"
250 FEET FROM SOUTH LINE AND 2410 FEET FROM EAST LINE
SECTION 12, T153N, R101W, 5TH P.M., MCKENZIE COUNTY, NORTH DAKOTA



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SCALE: 1" = 2 MILE

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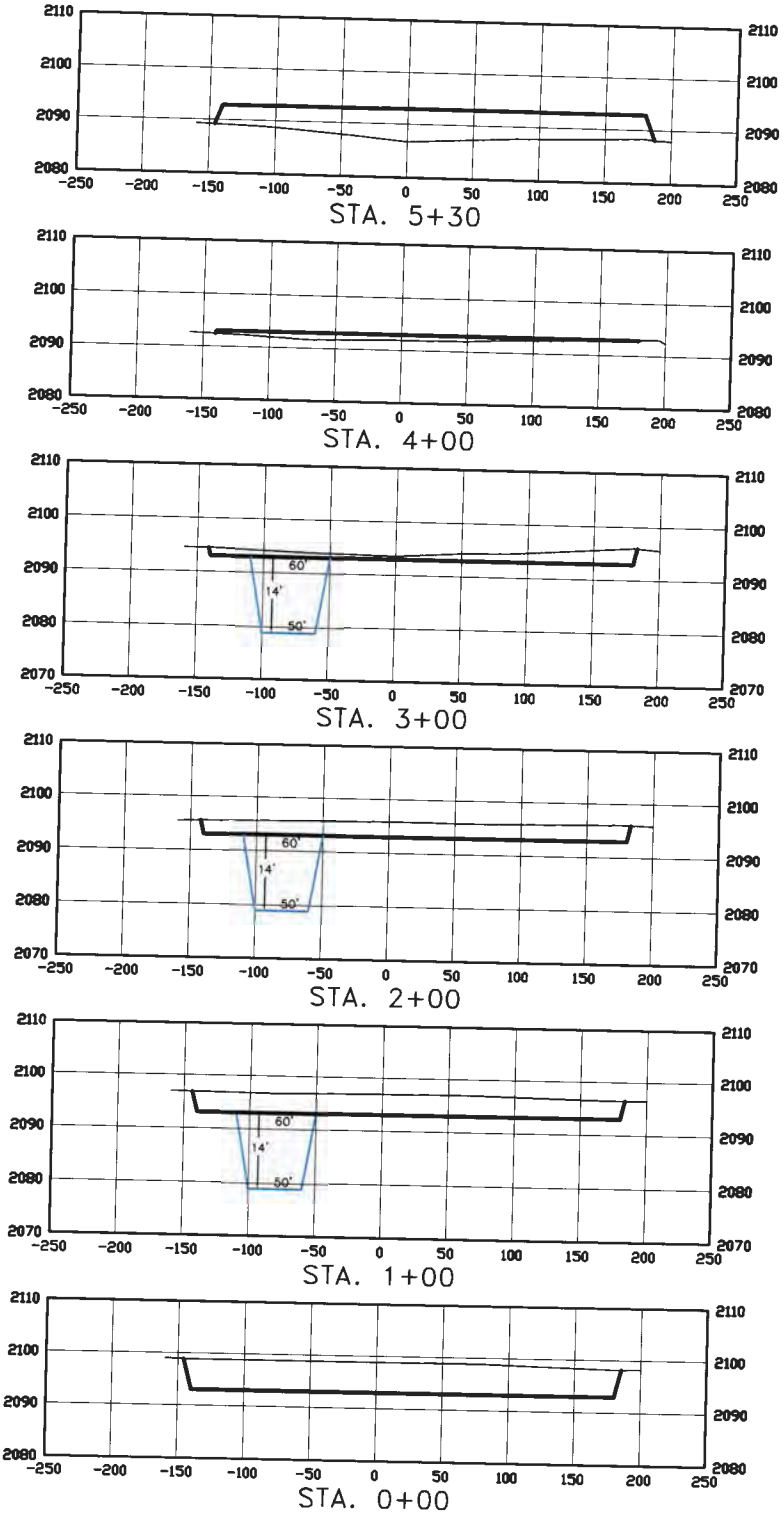
OASIS PETROLEUM NORTH AMERICA, LLC
COUNTY ROAD MAP
SECTION 12, T153N, R101W
MCKENZIE COUNTY, NORTH DAKOTA

Drawn By: J.J.S. | Project No.: S11-09-361
Checked By: D.D.K. | Date: DEC 2011

Revision No.	Date	By	Description
REV 1	1/19/12	JJS	SWAPPED WELL LOCATIONS
REV 2	2/5/13	BHH	MOVED BOTTOM HOLE / CHANGED NAME

CROSS SECTIONS

OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 1500 HOUSTON, TX 77002
"INNOKO 5301 43-12T"
250 FEET FROM SOUTH LINE AND 2410 FEET FROM EAST LINE
SECTION 12, T153N, R101W, 5TH P.M., MCKENZIE COUNTY, NORTH DAKOTA



REGISTERED LAND SURVEYOR
DARYL D. KASEMAN
LS-3880
DATE: 2/06/13
NORTH DAKOTA

THIS DOCUMENT WAS ORIGINALLY ISSUED AND SEALED BY DARYL D. KASEMAN, PLS, REGISTRATION NUMBER 3880 ON 2/06/13 AND THE ORIGINAL DOCUMENTS ARE STORED AT THE OFFICES OF INTERSTATE ENGINEERING, INC.

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

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OASIS PETROLEUM NORTH AMERICA, LLC
PAD CROSS SECTIONS
SECTION 12, T153N, R101W
MCKENZIE COUNTY, NORTH DAKOTA

Drawn By: J.J.S. | Project No.: S11-9-361
Checked By: D.D.K. | Date: DEC 2011

Revision No.	Date	By	Description
REV 1	1/19/12	JJS	SWAPPED WELL LOCATIONS
REV 2	2/5/13	BHH	MOVED BOTTOM HOLE / CHANGED NAME

WELL LOCATION SITE QUANTITIES

OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 1500 HOUSTON, TX 77002
"INNOKO 5301 43-12T"
250 FEET FROM SOUTH LINE AND 2410 FEET FROM EAST LINE
SECTION 12, T153N, R101W, 5TH P.M., MCKENZIE COUNTY, NORTH DAKOTA

WELL SITE ELEVATION	2093.6
WELL PAD ELEVATION	2093.0

EXCAVATION	12,909
PLUS PIT	3,150
	16,059
EMBANKMENT	4,705
PLUS SHRINKAGE (30%)	1,412
	6,117
STOCKPILE PIT	3,150
STOCKPILE TOP SOIL (6")	3,284
STOCKPILE FROM PAD	3,508
DISTURBED AREA FROM PAD	4.07 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
2410' FEL
250' FSL

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Other offices in Minnesota, North Dakota and South Dakota

OASIS PETROLEUM NORTH AMERICA, LLC
QUANTITIES
SECTION 12, T153N, R101W
MCKENZIE COUNTY, NORTH DAKOTA

Drawn By: J.J.S. Project No.: S11-09-361
Checked By: D.D.K. Date: DEC 2011

Revision No.	Date	By	Description
REV 1	1/19/12	JJS	SWAPPED WELL LOCATIONS
REV 2	2/5/13	BHH	MOVED BOTTOM HOLE / CHANGED NAME

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 2013 RECEIVED ND OIL & GAS DIVISION

Well File No. **22221**

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

- [x] Notice of Intent — Approximate Start Date: **Immediately**
- [ ] 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
- [x] Reclamation
- [ ] Other **Rescind APD permit**

Well Name and Number					
Timmons 5301 43-12B					
Footages	Qtr-Qtr	Section	Township	Range	
250 F S L 2410 F E L	**SWSE**	**12**	**153 N**	**101 W**	
Field	Pool	County			
Baker	**Bakken**	**McKenzie**			

24-HOUR PRODUCTION RATE

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

Name of Contractor(s)			
Address	City	State	Zip Code

DETAILS OF WORK

Oasis Petroleum North America LLC respectfully request that the permit issued for the above referenced well be canceled.

No construction per Heather's email.

Company		Telephone Number
Oasis Petroleum North America LLC		**281-404-9563**
Address		
1001 Fannin, Suite 1500		
City	State	Zip Code
Houston	**TX**	**77002**
Signature: Heather McCowan	Printed Name: **Heather McCowan**	
Title: **Regulatory Assistant**	Date: **April 10, 2013**	
Email Address: **hmccowan@oasispetroleum.com**		

FOR STATE USE ONLY

- [ ] Received
- [x] Approved

Date: 04-16-2013

By: David Burns

Title: Engineering Tech.

SUNDRY NOTICES AND REPORTS ON WELLS - FORM 4

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

DEC 2012 RECEIVED ND OIL & GAS DIVISION

Well File No. **22221**

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

- [x] Notice of Intent — Approximate Start Date: **December 27, 2012**
- [ ] 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
- [x] Other **Extend Drilling Permit**

Well Name and Number					
Timmons 5301 43-12B					
Footages	Qtr-Qtr	Section	Township	Range	
250 F S L 2410 F E L	**SWSE**	**12**	**153 N**	**101 W**	
Field	Pool	County			
Baker	**Bakken**	**McKenzie**			

24-HOUR PRODUCTION RATE

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

Name of Contractor(s)			
Address	City	State	Zip Code

DETAILS OF WORK

The drilling permit issued for this well will expire on January 10, 2013. We respectfully request a one year extenstion to this permit.
The $100 filing fee can be charged to the credit card on file.

Inv# 36059 01/03/2013 CC 100.00

Company		Telephone Number
Oasis Petroleum North America LLC		**281 404-9491**
Address		
1001 Fannin Suite 1500		
City	State	Zip Code
Houston	**TX**	**77002**
Signature	Printed Name	
	Brandi Terry	
Title	Date	
Regulatory Specialist	**December 27, 2011**	
Email Address		
bterry@oasispetroleum.com		

FOR STATE USE ONLY

[ ] Received	[x] Approved
Date	1-3-2013
By	
Title	**David Burns** Engineering Tech.

22221

S

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

December 14, 2012

OASIS PETRO NO AMER
1001 FANNIN STE 1500
HOUSTON, TX 77002

RE: TIMMONS 5301 43-12B
SWSE Sec. 12-153N-101W
MCKENZIE COUNTY
WELL FILE NO. 22221

Gentlemen:

The records and files of the Industrial Commission indicate that the above referenced permit will expire January 10, 2013.

Permits to drill are only valid for one year in the State of North Dakota. If you would like to renew for another year, please submit a Form 4 along with the $100.00 filing fee. Alternatively, you may elect to send in a Form 4 cancelling the permit. If you have any questions, please contact Todd Holweger.

Sincerely,

Jeanette Bean
Administrative Assistant

SUNDRY NOTICES AND REPORTS ON WELLS - FORM 4

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

JAN 2012 RECEIVED ND OIL & GAS DIVISION

Well File No. **22221**

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

☑ Notice of Intent	Approximate Start Date **January 18, 2012**	☐ Drilling Prognosis	☐ Spill Report
☐ Report of Work Done	Date Work Completed	☑ Redrilling or Repair	☐ Shooting
☐ Notice of Intent to Begin a Workover Project that may Qualify for a Tax Exemption Pursuant to NDCC Section 57-51.1-03.	Approximate Start Date	☐ Casing or Liner	☐ Acidizing
		☐ Plug Well	☐ Fracture Treatment
		☐ Supplemental History	☐ Change Production Method
		☐ Temporarily Abandon	☐ Reclamation
		☑ Other **Change surface location**	

Well Name and Number					
Timmons 5301 43-12B					
Footages	Qtr-Qtr	Section	Township	Range	
250 F S L 2510 F E L	**SWSE**	**12**	**153 N**	**101 W**	
Field	Pool	County			
Baker	**Bakken**	**McKenzie**			

24-HOUR PRODUCTION RATE

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

Name of Contractor(s)			
Address	City	State	Zip Code

DETAILS OF WORK

We respectfully request permission to revise the APD issued for this well to include the following change:
The surface location will change to 250' FSL & 2410' FEL, Sec. 12-153N-101W. Correlating to this surface location the new 7" casing point will be 703' FSL & 2529' FWL, Sec. 12-153N-101W at an azimuth of 324.3°. The new bottom hole location will be 200' FNL & 2000' FWL Sec. 1 T153N R101W at an azimuth of 0°.

The following statements remain true:
Notice has been provided to the owner of any permanently occupied dwelling within 1320 feet.
This well is not located within 500 feet of an occupied dwelling.

Attached is the new well plat, drill plan, directional plan, and directional plot.

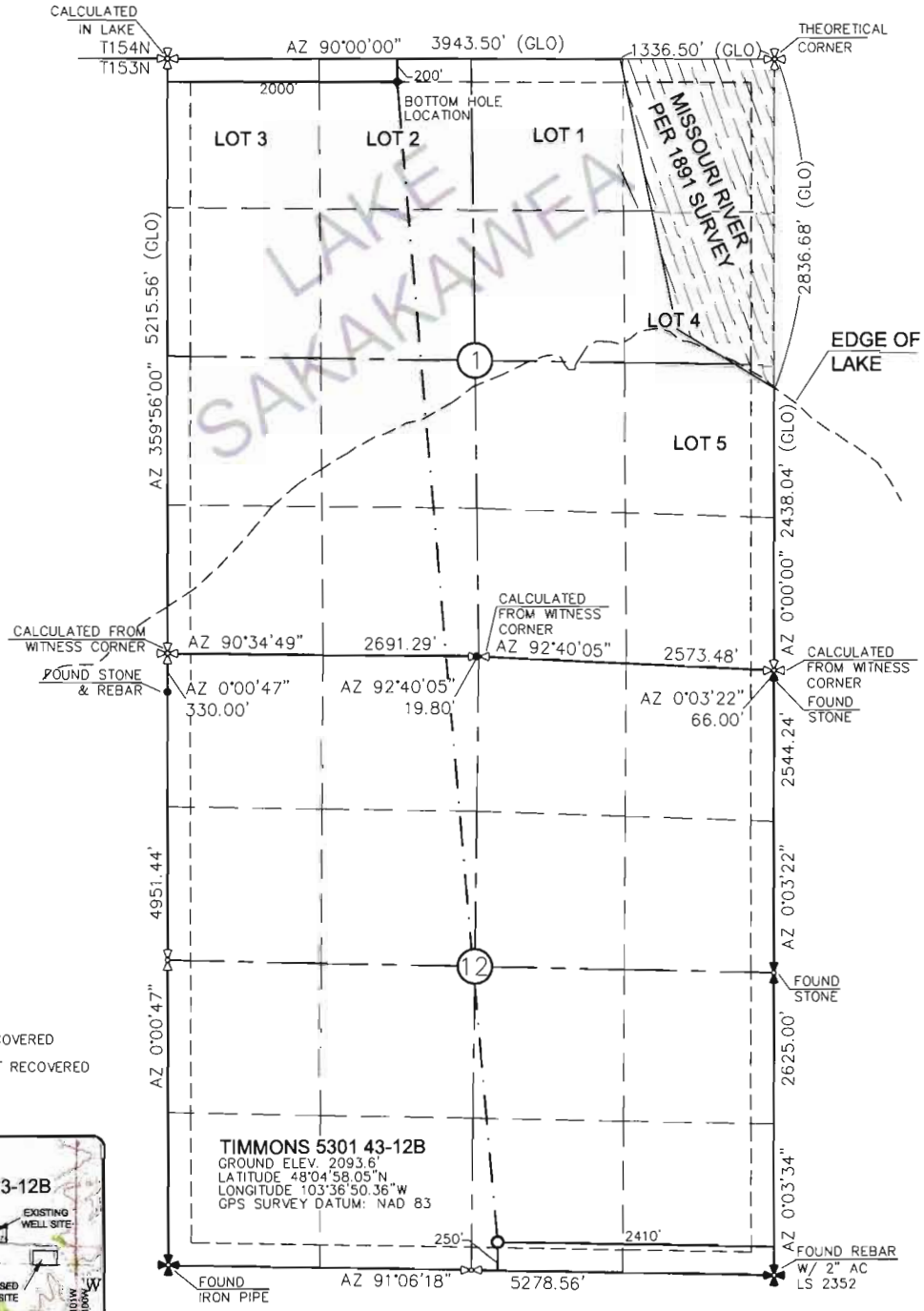
Company **Oasis Petroleum Inc.**		Telephone Number **(281) 404-9461**
Address **1001 Fannin, Suite 1500**		
City **Houston**	State **TX**	Zip Code **77002**
Signature Kaitlin Bass	Printed Name **Kaitlin Bass**	
Title **Operations Assistant**	Date **January 23, 2012**	
Email Address **kbass@oasispetroleum.com**		

FOR STATE USE ONLY

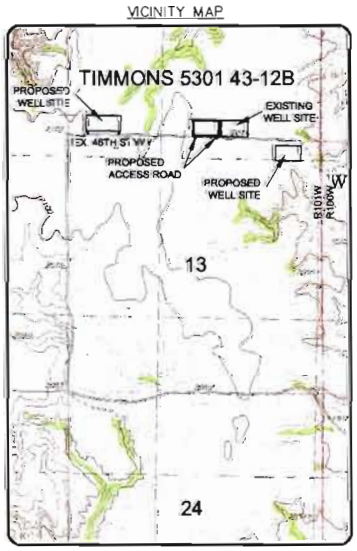
☐ Received	☒ Approved
Date 1-25-12	
By Nathaniel Erbele	
Title Petroleum Resource Specialist	

WELL LOCATION PLAT

OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 1500 HOUSTON, TX 77002
"TIMMONS 5301 43-12B"
250 FEET FROM SOUTH LINE AND 2410 FEET FROM EAST LINE
SECTION 12, T153N, R101W, 5TH P.M., MCKENZIE COUNTY, NORTH DAKOTA



VICINITY MAP



STAKED ON 12/6/11
VERTICAL CONTROL DATUM WAS BASED UPON CONTROL POINT 13 WITH AN ELEVATION OF 2090.8'

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

CARL S. VENDER LS 1222

NORTH DAKOTA CARL S. VENDER 1222 REGISTERED LAND SURVEYOR 1/20/12

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OASIS PETROLEUM NORTH AMERICA, LLC
WELL LOCATION PLAT
SECTION 12, T153N, R101W

MCKENZIE COUNTY, NORTH DAKOTA

Drawn By: J.J.S. Project No.: S11-09-361
Checked By: C.S.V. Date: DEC 2011

Revision No.	Date	By	Description
REV 1	1/19/12	JJS	STAKED WELL LOCATIONS

DRILLING PLAN

OPERATOR	Oasis Petroleum	COUNTY/STATE	McKenzie Co., ND
WELL NAME	Timbers 5103 43-12B	RIG	Nabors 148
WELL TYPE	Horizontal Middle Bakken		
LOCATION	Sec. 12 T153N R101W	Surface Location (survey plat): 250' fsl	2,410' fwl
EST. T.D.	20,822'	GROUND ELEV:	2096 Finished Pad Elev — Sub Height: 25
	TOTAL LATERAL: 9,707' (est)	KB ELEV:	2118'

PROGNOSIS: Based on 2,118' KB(est)

MARKER		DEPTH (Surf Loc)	DATUM (Surf Loc)
Pierre	NDIC MAP	1,968	150
Greenhorn		4,634	(2,516)
Mowry		5,030	(2,912)
Dakota		5,461	(3,343)
Rierdon		6,377	(4,259)
Dunham Salt		6,896	(4,778)
Dunham Salt Base		6,963	(4,845)
Spearfish		6,968	(4,850)
Pine Salt		7,212	(5,094)
Pine Salt Base		7,337	(5,219)
Opeche Salt		7,365	(5,247)
Opeche Salt Base		7,444	(5,326)
Broom Creek (Top of Minnelusa Gp.)		7,625	(5,507)
Amsden		7,668	(5,550)
Tyler		7,844	(5,726)
Otter (Base of Minnelusa Gp.)		8,031	(5,913)
Kibbey		8,365	(6,247)
Charles Salt		8,512	(6,394)
UB		9,135	(7,017)
Base Last Salt		9,212	(7,094)
Ratcliffe		9,260	(7,142)
Mission Canyon		9,436	(7,318)
Lodgepole		10,010	(7,892)
Lodgepole Fracture Zone		10,160	(8,042)
False Bakken		10,716	(8,598)
Upper Bakken		10,725	(8,607)
Middle Bakken		10,740	(8,622)
Middle Bakken Sand Target		10,747	(8,629)
Base Middle Bakken Sand Target		10,756	(8,638)
Lower Bakken		10,776	(8,658)
Three Forks		10,803	(8,685)

Dip Rate: Variable 2.46° to -0.71°

Max. Anticipated BHP: 4,863

LOGS:

Type	Interval
OH Logs: Infill-well no logs planned.	
CBL/GR: Above top of cement/GR to base of casing	
MWD GR: KOP to lateral TD	

DEVIATION:

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

DST'S:

None planned

CORES:

None planned

MUDLOGGING:

Two-Man: 8,312'
~200' above the Charles (Kibbey) to Casing point; Casing point to TD
30' samples at direction of wellsite geologist; 10' through target @ curve land

BOP:

11" 5000 psi blind, pipe & annular

Surface Formation: *Glacial till*

MUD:	Interval		Type	WT	Vis	WL	Remarks
Surface	0' -	2,070'	FW/Gel - Lime Sweeps	8.6 - 8.9	28-34	NC	Circ Mud Tanks
Intermediate	2,070' -	11,115'	Invert	9.6-10.4	40-60	30+(HpHt)	Circ Mud Tanks
Liner	11,115' -	20,822'	Salt Water	9.3-10.4	28-34	NC	Circ Mud Tanks

CASING:	Size	Wt ppf	Hole	Depth		Cement	WOC	Remarks
Surface:	9-5/8"	36#	13-1/2"	2,070'		To Surface	12	100' into Pierre
Intermediate:	7"	29/32#	8-3/4"	11,115'		4,961'	24	500' above Dakota
Production:	4.5"	11.6#	6"	20,822'	TOL @ 10,260'			50' above KOP

PROBABLE PLUGS, IF REQ'D:

OTHER:

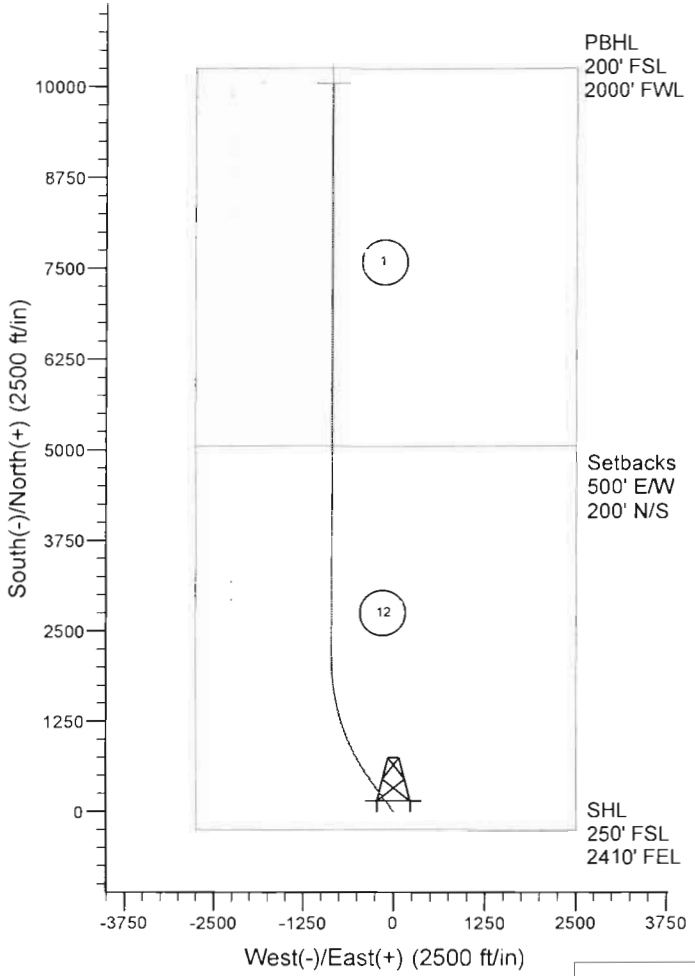
	MD	TVD	FNL/FSL	FEL/FWL	S-T-R	AZI
Surface:	2,070'	2,070'	250' FSL	2410' FEL	12-T153N-R101W	Survey Company:
KOP:	10,260'	10,256'	250' FSL	2410' FEL	12-T153N-R101W	Build Rate: 13 deg /100'
EOC:	11,009'	10,747'	660' FSL	2529' FWL	12-T153N-R101W	324.3
Casing Point:	11,115'	10,747'	700' FSL	2529' FWL	12-T153N-R101W	324.3
Middle Bakken Lateral TD:	20,822'	10,747'	200' FNL	2000' FWL	1-T153N-R101W	0.0

Comments:

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

OASIS PETROLEUM

Geology: SPG 12-27-2011 **Engineering:** L. Strong 1/18/2012



OASIS PETROLEUM

Project:	Indian Hills
Site:	153N-101W-1/12
Well:	Timmons 5301 43-12B
Wellbore:	OH
Design:	Plan #1

Azimuths to True North
Magnetic North: 8.55°

Magnetic Field
Strength: 56719.2snT
Dip Angle: 73.09°
Date: 12/27/2011
Model: IGRF200510

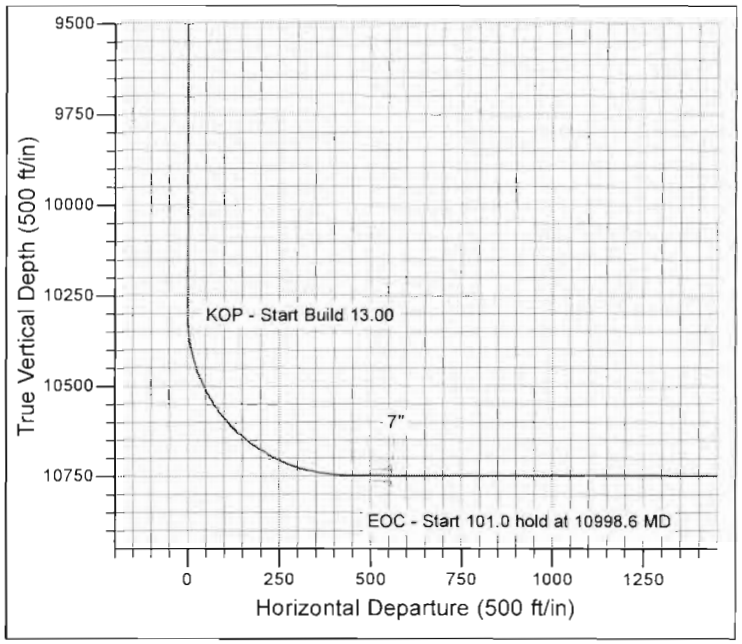
SITE DETAILS: 153N-101W-1/12

Site Centre Latitude: 48° 4' 57.940 N
Longitude: 103° 36' 41.780 W

Positional Uncertainity: 0.0
Convergence: -2.32
Local North: True

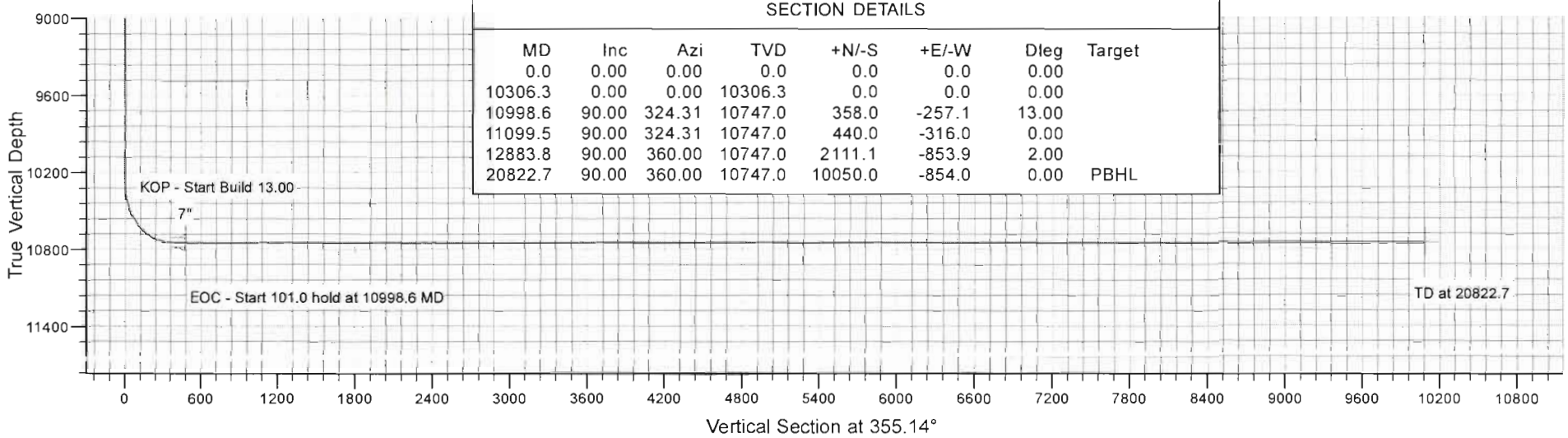
CASING DETAILS

TVD	MD	Name	Size
2070.0	2070.0	9 5/8"	9.625
10747.0	11115.0	7"	7.000



SECTION DETAILS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	
10306.3	0.00	0.00	10306.3	0.0	0.0	0.00	
10998.6	90.00	324.31	10747.0	358.0	-257.1	13.00	
11099.5	90.00	324.31	10747.0	440.0	-316.0	0.00	
12883.8	90.00	360.00	10747.0	2111.1	-853.9	2.00	
20822.7	90.00	360.00	10747.0	10050.0	-854.0	0.00	PBHL



Oasis

Indian Hills
153N-101W-1/12
Timmons 5301 43-12B

OH

Plan: Plan #1

Standard Planning Report

24 January, 2012

Microsoft

Planning Report

Database:	EDM 5000.1.9.0 Production DB	**Local Co-ordinate Reference:**	Well Timmons 5301 43-12B
Company:	Oasis	**TVD Reference:**	WELL @ 2118.0ft (Original Well Elev)
Project:	Indian Hills	**MD Reference:**	WELL @ 2118.0ft (Original Well Elev)
Site:	153N-101W-1/12	**North Reference:**	True
Well:	Timmons 5301 43-12B	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1		

Project Indian Hills

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

Site 153N-101W-1/12

Site Position:		**Northing:**	125,065.82 m	**Latitude:**	48° 4' 57.94(N
From:	Lat/Long	**Easting:**	368,244.93 m	**Longitude:**	103° 36' 41.780 W
Position Uncertainty:	0.0 ft	**Slot Radius:**	13.200 in	**Grid Convergence:**	-2.3 ? °

Well Timmons 5301 43-12B

Well Position	**+N/-S**	11.2 ft	**Northing:**	125,076.39 m	**Latitude:**	48° 4' 58.05(N
	+E/-W	-582.5 ft	**Easting:**	368,067.66 m	**Longitude:**	103° 36' 50.360 W
Position Uncertainty		0.0 ft	**Wellhead Elevation:**		**Ground Level:**	2,093.0 ft

Wellbore OH

Magnetics	**Model Name**	**Sample Date**	**Declination (°)**	**Dip Angle (°)**	**Field Strength (nT)**
	IGRF200510	12/27/2011	8.55	73.09	56,719

Design Plan #1

Audit Notes:

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

Vertical Section:	**Depth From (TVD) (ft)**	**+N/-S (ft)**	**+E/-W (ft)**	**Direction (°)**
	0.0	0.0	0.0	355.14

Plan Sections

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
10,306.3	0.00	0.00	10,306.3	0.0	0.0	0.00	0.00	0.00	0.00	
10,998.6	90.00	324.31	10,747.0	358.0	-257.1	13.00	13.00	0.00	324.31	
11,099.5	90.00	324.31	10,747.0	440.0	-316.0	0.00	0.00	0.00	0.00	
12,883.8	90.00	360.00	10,747.0	2,111.1	-853.9	2.00	0.00	2.00	90.00	
20,822.7	90.00	360.00	10,747.0	10,050.0	-854.0	0.00	0.00	0.00	0.00	Timmons 5301 43-12I

Database:	EDM 5000.1.9.0 Production DB	**Local Co-ordinate Reference:**	Well Timmons 5301 43-12B
Company:	Oasis	**TVD Reference:**	WELL @ 2118.0ft (Original Well Elev)
Project:	Indian Hills	**MD Reference:**	WELL @ 2118.0ft (Original Well Elev)
Site:	153N-101W-1/12	**North Reference:**	True
Well:	Timmons 5301 43-12B	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	0.00
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	0.00
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	0.00
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	0.00
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	0.00
600.0	0.00	0.00	600.0	0.0	0.0	0.0	0.00	0.00	0.00
700.0	0.00	0.00	700.0	0.0	0.0	0.0	0.00	0.00	0.00
800.0	0.00	0.00	800.0	0.0	0.0	0.0	0.00	0.00	0.00
900.0	0.00	0.00	900.0	0.0	0.0	0.0	0.00	0.00	0.00
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.0	0.00	0.00	0.00
1,100.0	0.00	0.00	1,100.0	0.0	0.0	0.0	0.00	0.00	0.00
1,200.0	0.00	0.00	1,200.0	0.0	0.0	0.0	0.00	0.00	0.00
1,300.0	0.00	0.00	1,300.0	0.0	0.0	0.0	0.00	0.00	0.00
1,400.0	0.00	0.00	1,400.0	0.0	0.0	0.0	0.00	0.00	0.00
1,500.0	0.00	0.00	1,500.0	0.0	0.0	0.0	0.00	0.00	0.00
1,600.0	0.00	0.00	1,600.0	0.0	0.0	0.0	0.00	0.00	0.00
1,700.0	0.00	0.00	1,700.0	0.0	0.0	0.0	0.00	0.00	0.00
1,800.0	0.00	0.00	1,800.0	0.0	0.0	0.0	0.00	0.00	0.00
1,900.0	0.00	0.00	1,900.0	0.0	0.0	0.0	0.00	0.00	0.00
1,968.0	0.00	0.00	1,968.0	0.0	0.0	0.0	0.00	0.00	0.00
Pierre									
2,000.0	0.00	0.00	2,000.0	0.0	0.0	0.0	0.00	0.00	0.00
2,070.0	0.00	0.00	2,070.0	0.0	0.0	0.0	0.00	0.00	0.00
9 5/8"									
2,100.0	0.00	0.00	2,100.0	0.0	0.0	0.0	0.00	0.00	0.00
2,200.0	0.00	0.00	2,200.0	0.0	0.0	0.0	0.00	0.00	0.00
2,300.0	0.00	0.00	2,300.0	0.0	0.0	0.0	0.00	0.00	0.00
2,400.0	0.00	0.00	2,400.0	0.0	0.0	0.0	0.00	0.00	0.00
2,500.0	0.00	0.00	2,500.0	0.0	0.0	0.0	0.00	0.00	0.00
2,600.0	0.00	0.00	2,600.0	0.0	0.0	0.0	0.00	0.00	0.00
2,700.0	0.00	0.00	2,700.0	0.0	0.0	0.0	0.00	0.00	0.00
2,800.0	0.00	0.00	2,800.0	0.0	0.0	0.0	0.00	0.00	0.00
2,900.0	0.00	0.00	2,900.0	0.0	0.0	0.0	0.00	0.00	0.00
3,000.0	0.00	0.00	3,000.0	0.0	0.0	0.0	0.00	0.00	0.00
3,100.0	0.00	0.00	3,100.0	0.0	0.0	0.0	0.00	0.00	0.00
3,200.0	0.00	0.00	3,200.0	0.0	0.0	0.0	0.00	0.00	0.00
3,300.0	0.00	0.00	3,300.0	0.0	0.0	0.0	0.00	0.00	0.00
3,400.0	0.00	0.00	3,400.0	0.0	0.0	0.0	0.00	0.00	0.00
3,500.0	0.00	0.00	3,500.0	0.0	0.0	0.0	0.00	0.00	0.00
3,600.0	0.00	0.00	3,600.0	0.0	0.0	0.0	0.00	0.00	0.00
3,700.0	0.00	0.00	3,700.0	0.0	0.0	0.0	0.00	0.00	0.00
3,800.0	0.00	0.00	3,800.0	0.0	0.0	0.0	0.00	0.00	0.00
3,900.0	0.00	0.00	3,900.0	0.0	0.0	0.0	0.00	0.00	0.00
4,000.0	0.00	0.00	4,000.0	0.0	0.0	0.0	0.00	0.00	0.00
4,100.0	0.00	0.00	4,100.0	0.0	0.0	0.0	0.00	0.00	0.00
4,200.0	0.00	0.00	4,200.0	0.0	0.0	0.0	0.00	0.00	0.00
4,300.0	0.00	0.00	4,300.0	0.0	0.0	0.0	0.00	0.00	0.00
4,400.0	0.00	0.00	4,400.0	0.0	0.0	0.0	0.00	0.00	0.00
4,500.0	0.00	0.00	4,500.0	0.0	0.0	0.0	0.00	0.00	0.00
4,600.0	0.00	0.00	4,600.0	0.0	0.0	0.0	0.00	0.00	0.00
4,634.0	0.00	0.00	4,634.0	0.0	0.0	0.0	0.00	0.00	0.00
Greenhorn									

Database:	EDM 5000.1.9.0 Production DB	**Local Co-ordinate Reference:**	Well Timmons 5301 43-12B
Company:	Oasis	**TVD Reference:**	WELL @ 2118.0ft (Original Well Elev)
Project:	Indian Hills	**MD Reference:**	WELL @ 2118.0ft (Original Well Elev)
Site:	153N-101W-1/12	**North Reference:**	True
Well:	Timmons 5301 43-12B	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
4,700.0	0.00	0.00	4,700.0	0.0	0.0	0.0	0.00	0.00	0.00
4,800.0	0.00	0.00	4,800.0	0.0	0.0	0.0	0.00	0.00	0.00
4,900.0	0.00	0.00	4,900.0	0.0	0.0	0.0	0.00	0.00	0.00
5,000.0	0.00	0.00	5,000.0	0.0	0.0	0.0	0.00	0.00	0.00
5,030.0	0.00	0.00	5,030.0	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
5,461.0	0.00	0.00	5,461.0	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
6,377.0	0.00	0.00	6,377.0	0.0	0.0	0.0	0.00	0.00	0.00
Rierdon									
6,400.0	0.00	0.00	6,400.0	0.0	0.0	0.0	0.00	0.00	0.00
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
6,896.0	0.00	0.00	6,896.0	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
6,963.0	0.00	0.00	6,963.0	0.0	0.0	0.0	0.00	0.00	0.00
Dunham Salt Base									
6,968.0	0.00	0.00	6,968.0	0.0	0.0	0.0	0.00	0.00	0.00
Spearfish									
7,000.0	0.00	0.00	7,000.0	0.0	0.0	0.0	0.00	0.00	0.00
7,100.0	0.00	0.00	7,100.0	0.0	0.0	0.0	0.00	0.00	0.00
7,200.0	0.00	0.00	7,200.0	0.0	0.0	0.0	0.00	0.00	0.00
7,212.0	0.00	0.00	7,212.0	0.0	0.0	0.0	0.00	0.00	0.00
Pine Salt									
7,300.0	0.00	0.00	7,300.0	0.0	0.0	0.0	0.00	0.00	0.00
7,337.0	0.00	0.00	7,337.0	0.0	0.0	0.0	0.00	0.00	0.00
Pine Salt Base									
7,365.0	0.00	0.00	7,365.0	0.0	0.0	0.0	0.00	0.00	0.00
Opeche Salt									
7,400.0	0.00	0.00	7,400.0	0.0	0.0	0.0	0.00	0.00	0.00
7,444.0	0.00	0.00	7,444.0	0.0	0.0	0.0	0.00	0.00	0.00
Opeche Salt Base									
7,500.0	0.00	0.00	7,500.0	0.0	0.0	0.0	0.00	0.00	0.00
7,600.0	0.00	0.00	7,600.0	0.0	0.0	0.0	0.00	0.00	0.00
7,625.0	0.00	0.00	7,625.0	0.0	0.0	0.0	0.00	0.00	0.00
Broom Creek (Top of Minnelusa Gp.)									
7,668.0	0.00	0.00	7,668.0	0.0	0.0	0.0	0.00	0.00	0.00

Database:	EDM 5000.1.9.0 Production DB	**Local Co-ordinate Reference:**	Well Timmons 5301 43-12B
Company:	Oasis	**TVD Reference:**	WELL @ 2118.0ft (Original Well Elev)
Project:	Indian Hills	**MD Reference:**	WELL @ 2118.0ft (Original Well Elev)
Site:	153N-101W-1/12	**North Reference:**	True
Well:	Timmons 5301 43-12B	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
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
7,844.0	0.00	0.00	7,844.0	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
8,031.0	0.00	0.00	8,031.0	0.0	0.0	0.0	0.00	0.00	0.00
Otter (Base of Minnelusa Gp.)									
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
8,365.0	0.00	0.00	8,365.0	0.0	0.0	0.0	0.00	0.00	0.00
Kibbey									
8,400.0	0.00	0.00	8,400.0	0.0	0.0	0.0	0.00	0.00	0.00
8,500.0	0.00	0.00	8,500.0	0.0	0.0	0.0	0.00	0.00	0.00
8,512.0	0.00	0.00	8,512.0	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
9,135.0	0.00	0.00	9,135.0	0.0	0.0	0.0	0.00	0.00	0.00
UB									
9,200.0	0.00	0.00	9,200.0	0.0	0.0	0.0	0.00	0.00	0.00
9,212.0	0.00	0.00	9,212.0	0.0	0.0	0.0	0.00	0.00	0.00
Base Last Salt									
9,260.0	0.00	0.00	9,260.0	0.0	0.0	0.0	0.00	0.00	0.00
Ratcliffe									
9,300.0	0.00	0.00	9,300.0	0.0	0.0	0.0	0.00	0.00	0.00
9,400.0	0.00	0.00	9,400.0	0.0	0.0	0.0	0.00	0.00	0.00
9,436.0	0.00	0.00	9,436.0	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
10,000.0	0.00	0.00	10,000.0	0.0	0.0	0.0	0.00	0.00	0.00
10,010.0	0.00	0.00	10,010.0	0.0	0.0	0.0	0.00	0.00	0.00
Lodgepole									
10,100.0	0.00	0.00	10,100.0	0.0	0.0	0.0	0.00	0.00	0.00
10,160.0	0.00	0.00	10,160.0	0.0	0.0	0.0	0.00	0.00	0.00
Lodgepole Fracture Zone									
10,200.0	0.00	0.00	10,200.0	0.0	0.0	0.0	0.00	0.00	0.00
10,306.3	0.00	0.00	10,306.3	0.0	0.0	0.0	0.00	0.00	0.00
KOP - Start Build 13.00									
10,325.0	2.44	324.31	10,325.0	0.3	-0.2	0.3	13.00	13.00	0.00
10,350.0	5.69	324.31	10,349.9	1.8	-1.3	1.9	13.00	13.00	0.00
10,375.0	8.94	324.31	10,374.7	4.3	-3.1	4.6	13.00	13.00	0.00

Database:	EDM 5000.1.9.0 Production DB	**Local Co-ordinate Reference:**	Well Timmons 5301 43-12B
Company:	Oasis	**TVD Reference:**	WELL @ 2118.0ft (Original Well Elev)
Project:	Indian Hills	**MD Reference:**	WELL @ 2118.0ft (Original Well Elev)
Site:	153N-101W-1/12	**North Reference:**	True
Well:	Timmons 5301 43-12B	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
10,400.0	12.19	324.31	10,399.3	8.1	-5.8	8.5	13.00	13.00	0.00
10,425.0	15.44	324.31	10,423.6	12.9	-9.3	13.7	13.00	13.00	0.00
10,450.0	18.69	324.31	10,447.5	18.9	-13.6	19.9	13.00	13.00	0.00
10,475.0	21.94	324.31	10,470.9	25.9	-18.6	27.4	13.00	13.00	0.00
10,500.0	25.19	324.31	10,493.8	34.0	-24.4	36.0	13.00	13.00	0.00
10,525.0	28.44	324.31	10,516.1	43.2	-31.0	45.7	13.00	13.00	0.00
10,550.0	31.69	324.31	10,537.8	53.4	-38.3	56.4	13.00	13.00	0.00
10,575.0	34.94	324.31	10,558.7	64.5	-46.3	68.2	13.00	13.00	0.00
10,600.0	38.19	324.31	10,578.7	76.6	-55.0	81.0	13.00	13.00	0.00
10,625.0	41.44	324.31	10,597.9	89.6	-64.4	94.7	13.00	13.00	0.00
10,650.0	44.69	324.31	10,616.2	103.5	-74.3	109.4	13.00	13.00	0.00
10,675.0	47.94	324.31	10,633.5	118.1	-84.9	124.9	13.00	13.00	0.00
10,700.0	51.19	324.31	10,649.7	133.6	-95.9	141.2	13.00	13.00	0.00
10,725.0	54.44	324.31	10,664.8	149.8	-107.6	158.3	13.00	13.00	0.00
10,750.0	57.69	324.31	10,678.7	166.6	-119.7	176.2	13.00	13.00	0.00
10,775.0	60.94	324.31	10,691.5	184.1	-132.2	194.6	13.00	13.00	0.00
10,800.0	64.19	324.31	10,703.0	202.1	-145.1	213.7	13.00	13.00	0.00
10,825.0	67.44	324.31	10,713.3	220.6	-158.4	233.2	13.00	13.00	0.00
10,832.3	68.38	324.31	10,716.0	226.1	-162.4	239.0	13.00	13.00	0.00
False Bakken									
10,850.0	70.69	324.31	10,722.2	239.6	-172.1	253.3	13.00	13.00	0.00
10,858.7	71.82	324.31	10,725.0	246.3	-176.9	260.4	13.00	13.00	0.00
Upper Bakken									
10,875.0	73.94	324.31	10,729.8	258.9	-186.0	273.7	13.00	13.00	0.00
10,900.0	77.19	324.31	10,736.0	278.6	-200.1	294.5	13.00	13.00	0.00
10,919.9	79.77	324.31	10,740.0	294.4	-211.5	311.3	13.00	13.00	0.00
Middle Bakken									
10,925.0	80.44	324.31	10,740.9	298.5	-214.4	315.6	13.00	13.00	0.00
10,950.0	83.69	324.31	10,744.3	318.6	-228.8	336.8	13.00	13.00	0.00
10,975.0	86.94	324.31	10,746.4	338.8	-243.4	358.2	13.00	13.00	0.00
10,998.5	90.00	324.31	10,747.0	358.0	-257.1	378.4	13.00	13.00	0.00
EOC - Start 101.0 hold at 10998.6 MD - Middle Bakken Sand Target									
11,000.0	90.00	324.31	10,747.0	359.1	-257.9	379.7	0.21	0.21	0.00
11,099.5	90.00	324.31	10,747.0	440.0	-316.0	465.2	0.00	0.00	0.00
Start DLS 2.00 TFO 90.00									
11,115.0	90.00	324.62	10,747.0	452.6	-325.0	478.5	2.00	0.00	2.00
7"									
11,200.0	90.00	326.32	10,747.0	522.6	-373.2	552.3	2.00	0.00	2.00
11,300.0	90.00	328.32	10,747.0	606.8	-427.1	640.8	2.00	0.00	2.00
11,400.0	90.00	330.32	10,747.0	692.8	-478.2	730.8	2.00	0.00	2.00
11,500.0	90.00	332.32	10,747.0	780.5	-526.1	822.2	2.00	0.00	2.00
11,600.0	90.00	334.32	10,747.0	869.9	-571.0	915.1	2.00	0.00	2.00
11,700.0	90.00	336.32	10,747.0	960.7	-612.8	1,009.1	2.00	0.00	2.00
11,800.0	90.00	338.32	10,747.0	1,053.0	-651.3	1,104.3	2.00	0.00	2.00
11,900.0	90.00	340.32	10,747.0	1,146.5	-686.6	1,200.6	2.00	0.00	2.00
12,000.0	90.00	342.32	10,747.0	1,241.3	-718.7	1,297.7	2.00	0.00	2.00
12,100.0	90.00	344.32	10,747.0	1,337.1	-747.4	1,395.5	2.00	0.00	2.00
12,200.0	90.00	346.32	10,747.0	1,433.8	-772.7	1,494.1	2.00	0.00	2.00
12,300.0	90.00	348.32	10,747.0	1,531.3	-794.6	1,593.1	2.00	0.00	2.00
12,400.0	90.00	350.32	10,747.0	1,629.6	-813.2	1,692.6	2.00	0.00	2.00
12,500.0	90.00	352.32	10,747.0	1,728.5	-828.2	1,792.4	2.00	0.00	2.00
12,600.0	90.00	354.32	10,747.0	1,827.8	-839.9	1,892.3	2.00	0.00	2.00
12,700.0	90.00	356.32	10,747.0	1,927.4	-848.0	1,992.3	2.00	0.00	2.00

Database:	EDM 5000.1.9.0 Production DB	**Local Co-ordinate Reference:**	Well Timmons 5301 43-12B
Company:	Oasis	**TVD Reference:**	WELL @ 2118.0ft (Original Well Elev)
Project:	Indian Hills	**MD Reference:**	WELL @ 2118.0ft (Original Well Elev)
Site:	153N-101W-1/12	**North Reference:**	True
Well:	Timmons 5301 43-12B	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
12,800.0	90.00	358.32	10,747.0	2,027.3	-852.7	2,092.2	2.00	0.00	2.00
12,883.8	90.00	360.00	10,747.0	2,111.1	-853.9	2,175.8	2.00	0.00	2.00
Start 7938.9 hold at 12883.8 MD									
12,900.0	90.00	360.00	10,747.0	2,127.3	-853.9	2,192.0	0.00	0.00	0.00
13,000.0	90.00	360.00	10,747.0	2,227.3	-853.9	2,291.6	0.00	0.00	0.00
13,100.0	90.00	360.00	10,747.0	2,327.3	-853.9	2,391.3	0.00	0.00	0.00
13,200.0	90.00	360.00	10,747.0	2,427.3	-853.9	2,490.9	0.00	0.00	0.00
13,300.0	90.00	360.00	10,747.0	2,527.3	-853.9	2,590.5	0.00	0.00	0.00
13,400.0	90.00	360.00	10,747.0	2,627.3	-853.9	2,690.2	0.00	0.00	0.00
13,500.0	90.00	360.00	10,747.0	2,727.3	-853.9	2,789.8	0.00	0.00	0.00
13,600.0	90.00	360.00	10,747.0	2,827.3	-853.9	2,889.5	0.00	0.00	0.00
13,700.0	90.00	360.00	10,747.0	2,927.3	-853.9	2,989.1	0.00	0.00	0.00
13,800.0	90.00	360.00	10,747.0	3,027.3	-853.9	3,088.7	0.00	0.00	0.00
13,900.0	90.00	360.00	10,747.0	3,127.3	-853.9	3,188.4	0.00	0.00	0.00
14,000.0	90.00	360.00	10,747.0	3,227.3	-853.9	3,288.0	0.00	0.00	0.00
14,100.0	90.00	360.00	10,747.0	3,327.3	-853.9	3,387.7	0.00	0.00	0.00
14,200.0	90.00	360.00	10,747.0	3,427.3	-853.9	3,487.3	0.00	0.00	0.00
14,300.0	90.00	360.00	10,747.0	3,527.3	-853.9	3,586.9	0.00	0.00	0.00
14,400.0	90.00	360.00	10,747.0	3,627.3	-853.9	3,686.6	0.00	0.00	0.00
14,500.0	90.00	360.00	10,747.0	3,727.3	-853.9	3,786.2	0.00	0.00	0.00
14,600.0	90.00	360.00	10,747.0	3,827.3	-853.9	3,885.9	0.00	0.00	0.00
14,700.0	90.00	360.00	10,747.0	3,927.3	-853.9	3,985.5	0.00	0.00	0.00
14,800.0	90.00	360.00	10,747.0	4,027.3	-853.9	4,085.2	0.00	0.00	0.00
14,900.0	90.00	360.00	10,747.0	4,127.3	-853.9	4,184.8	0.00	0.00	0.00
15,000.0	90.00	360.00	10,747.0	4,227.3	-853.9	4,284.4	0.00	0.00	0.00
15,100.0	90.00	360.00	10,747.0	4,327.3	-853.9	4,384.1	0.00	0.00	0.00
15,200.0	90.00	360.00	10,747.0	4,427.3	-853.9	4,483.7	0.00	0.00	0.00
15,300.0	90.00	360.00	10,747.0	4,527.3	-853.9	4,583.4	0.00	0.00	0.00
15,400.0	90.00	360.00	10,747.0	4,627.3	-853.9	4,683.0	0.00	0.00	0.00
15,500.0	90.00	360.00	10,747.0	4,727.3	-853.9	4,782.6	0.00	0.00	0.00
15,600.0	90.00	360.00	10,747.0	4,827.3	-853.9	4,882.3	0.00	0.00	0.00
15,700.0	90.00	360.00	10,747.0	4,927.3	-853.9	4,981.9	0.00	0.00	0.00
15,800.0	90.00	360.00	10,747.0	5,027.3	-853.9	5,081.6	0.00	0.00	0.00
15,900.0	90.00	360.00	10,747.0	5,127.3	-853.9	5,181.2	0.00	0.00	0.00
16,000.0	90.00	360.00	10,747.0	5,227.3	-853.9	5,280.8	0.00	0.00	0.00
16,100.0	90.00	360.00	10,747.0	5,327.3	-853.9	5,380.5	0.00	0.00	0.00
16,200.0	90.00	360.00	10,747.0	5,427.3	-853.9	5,480.1	0.00	0.00	0.00
16,300.0	90.00	360.00	10,747.0	5,527.3	-853.9	5,579.8	0.00	0.00	0.00
16,400.0	90.00	360.00	10,747.0	5,627.3	-853.9	5,679.4	0.00	0.00	0.00
16,500.0	90.00	360.00	10,747.0	5,727.3	-854.0	5,779.0	0.00	0.00	0.00
16,600.0	90.00	360.00	10,747.0	5,827.3	-854.0	5,878.7	0.00	0.00	0.00
16,700.0	90.00	360.00	10,747.0	5,927.3	-854.0	5,978.3	0.00	0.00	0.00
16,800.0	90.00	360.00	10,747.0	6,027.3	-854.0	6,078.0	0.00	0.00	0.00
16,900.0	90.00	360.00	10,747.0	6,127.3	-854.0	6,177.6	0.00	0.00	0.00
17,000.0	90.00	360.00	10,747.0	6,227.3	-854.0	6,277.3	0.00	0.00	0.00
17,100.0	90.00	360.00	10,747.0	6,327.3	-854.0	6,376.9	0.00	0.00	0.00
17,200.0	90.00	360.00	10,747.0	6,427.3	-854.0	6,476.5	0.00	0.00	0.00
17,300.0	90.00	360.00	10,747.0	6,527.3	-854.0	6,576.2	0.00	0.00	0.00
17,400.0	90.00	360.00	10,747.0	6,627.3	-854.0	6,675.8	0.00	0.00	0.00
17,500.0	90.00	360.00	10,747.0	6,727.3	-854.0	6,775.5	0.00	0.00	0.00
17,600.0	90.00	360.00	10,747.0	6,827.3	-854.0	6,875.1	0.00	0.00	0.00
17,700.0	90.00	360.00	10,747.0	6,927.3	-854.0	6,974.7	0.00	0.00	0.00
17,800.0	90.00	360.00	10,747.0	7,027.3	-854.0	7,074.4	0.00	0.00	0.00

Database:	EDM 5000.1.9.0 Production DB	**Local Co-ordinate Reference:**	Well Timmons 5301 43-12B
Company:	Oasis	**TVD Reference:**	WELL @ 2118.0ft (Original Well Elev)
Project:	Indian Hills	**MD Reference:**	WELL @ 2118.0ft (Original Well Elev)
Site:	153N-101W-1/12	**North Reference:**	True
Well:	Timmons 5301 43-12B	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
17,900.0	90.00	360.00	10,747.0	7,127.3	-854.0	7,174.0	0.00	0.00	0.00
18,000.0	90.00	360.00	10,747.0	7,227.3	-854.0	7,273.7	0.00	0.00	0.00
18,100.0	90.00	360.00	10,747.0	7,327.3	-854.0	7,373.3	0.00	0.00	0.00
18,200.0	90.00	360.00	10,747.0	7,427.3	-854.0	7,472.9	0.00	0.00	0.00
18,300.0	90.00	360.00	10,747.0	7,527.3	-854.0	7,572.6	0.00	0.00	0.00
18,400.0	90.00	360.00	10,747.0	7,627.3	-854.0	7,672.2	0.00	0.00	0.00
18,500.0	90.00	360.00	10,747.0	7,727.3	-854.0	7,771.9	0.00	0.00	0.00
18,600.0	90.00	360.00	10,747.0	7,827.3	-854.0	7,871.5	0.00	0.00	0.00
18,700.0	90.00	360.00	10,747.0	7,927.3	-854.0	7,971.2	0.00	0.00	0.00
18,800.0	90.00	360.00	10,747.0	8,027.3	-854.0	8,070.8	0.00	0.00	0.00
18,900.0	90.00	360.00	10,747.0	8,127.3	-854.0	8,170.4	0.00	0.00	0.00
19,000.0	90.00	360.00	10,747.0	8,227.3	-854.0	8,270.1	0.00	0.00	0.00
19,100.0	90.00	360.00	10,747.0	8,327.3	-854.0	8,369.7	0.00	0.00	0.00
19,200.0	90.00	360.00	10,747.0	8,427.3	-854.0	8,469.4	0.00	0.00	0.00
19,300.0	90.00	360.00	10,747.0	8,527.3	-854.0	8,569.0	0.00	0.00	0.00
19,400.0	90.00	360.00	10,747.0	8,627.3	-854.0	8,668.6	0.00	0.00	0.00
19,500.0	90.00	360.00	10,747.0	8,727.3	-854.0	8,768.3	0.00	0.00	0.00
19,600.0	90.00	360.00	10,747.0	8,827.3	-854.0	8,867.9	0.00	0.00	0.00
19,700.0	90.00	360.00	10,747.0	8,927.3	-854.0	8,967.6	0.00	0.00	0.00
19,800.0	90.00	360.00	10,747.0	9,027.3	-854.0	9,067.2	0.00	0.00	0.00
19,900.0	90.00	360.00	10,747.0	9,127.3	-854.0	9,166.8	0.00	0.00	0.00
20,000.0	90.00	360.00	10,747.0	9,227.3	-854.0	9,266.5	0.00	0.00	0.00
20,100.0	90.00	360.00	10,747.0	9,327.3	-854.0	9,366.1	0.00	0.00	0.00
20,200.0	90.00	360.00	10,747.0	9,427.3	-854.0	9,465.8	0.00	0.00	0.00
20,300.0	90.00	360.00	10,747.0	9,527.3	-854.0	9,565.4	0.00	0.00	0.00
20,400.0	90.00	360.00	10,747.0	9,627.3	-854.0	9,665.0	0.00	0.00	0.00
20,500.0	90.00	360.00	10,747.0	9,727.3	-854.0	9,764.7	0.00	0.00	0.00
20,600.0	90.00	360.00	10,747.0	9,827.3	-854.0	9,864.3	0.00	0.00	0.00
20,700.0	90.00	360.00	10,747.0	9,927.3	-854.0	9,964.0	0.00	0.00	0.00
20,800.0	90.00	360.00	10,747.0	10,027.3	-854.0	10,063.6	0.00	0.00	0.00
20,822.7	90.00	360.00	10,747.0	10,050.0	-854.0	10,086.2	0.00	0.00	0.00
TD at 20822.7									

Design Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (m)	Easting (m)	Latitude	Longitude
Timmons 5301 43-12B F - plan hits target center - Point	0.00	0.00	10,747.0	10,050.0	-854.0	128,147.65	367,931.42	48° 6' 37.233 N	103° 37' 2.945 W

Casing Points

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (in)	Hole Diameter (in)
2,070.0	2,070.0	9 5/8"	9.625	13.500
11,115.0	10,747.0	7"	7.000	8.750

Database:	EDM 5000.1.9.0 Production DB	**Local Co-ordinate Reference:**	Well Timmons 5301 43-12B
Company:	Oasis	**TVD Reference:**	WELL @ 2118.0ft (Original Well Elev)
Project:	Indian Hills	**MD Reference:**	WELL @ 2118.0ft (Original Well Elev)
Site:	153N-101W-1/12	**North Reference:**	True
Well:	Timmons 5301 43-12B	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1		

Formations

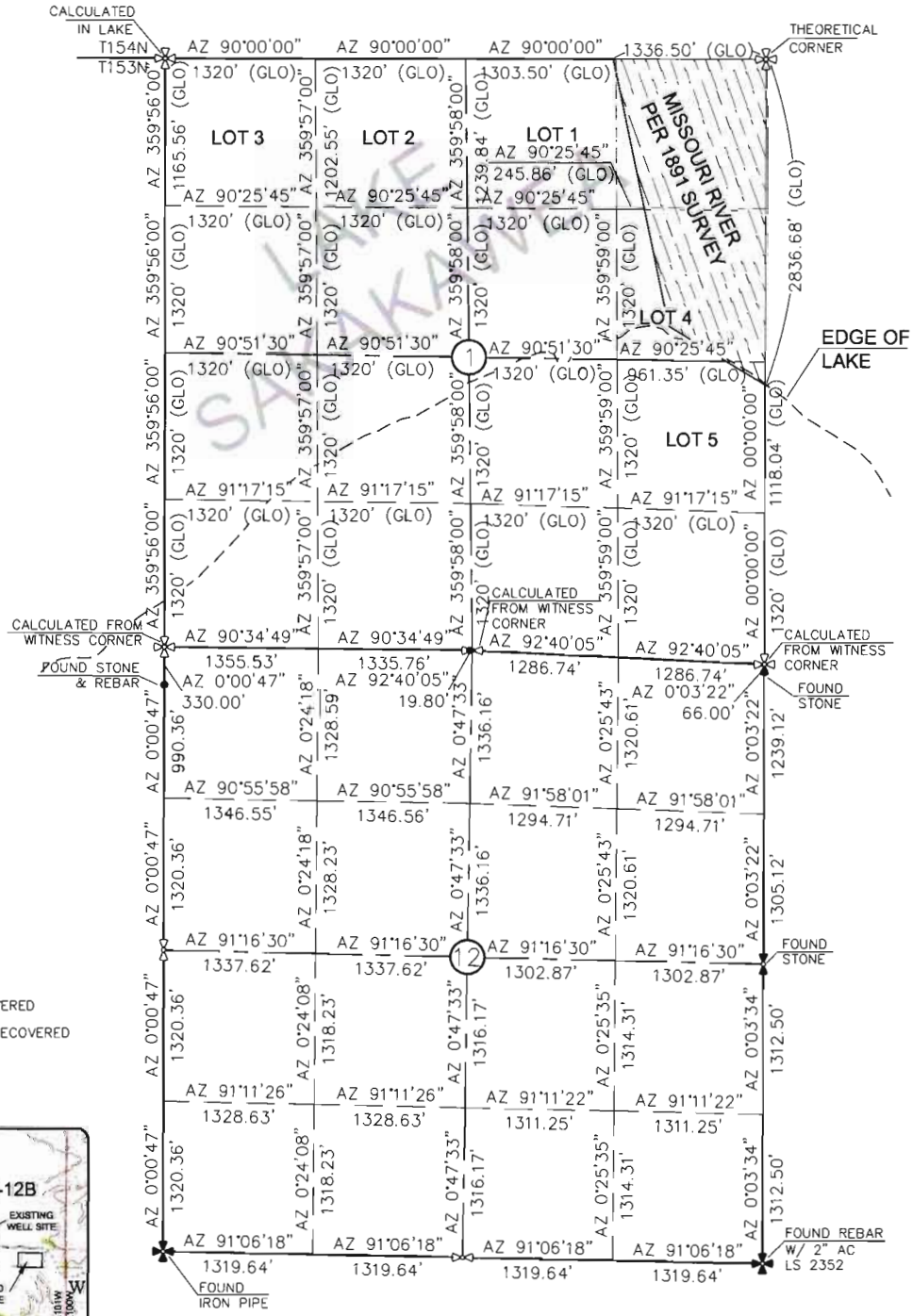
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
1,968.0	1,968.0	Pierre			
4,634.0	4,634.0	Greenhorn			
5,030.0	5,030.0	Mowry			
5,461.0	5,461.0	Dakota			
6,377.0	6,377.0	Rierdon			
6,896.0	6,896.0	Dunham Salt			
6,963.0	6,963.0	Dunham Salt Base			
6,968.0	6,968.0	Spearfish			
7,212.0	7,212.0	Pine Salt			
7,337.0	7,337.0	Pine Salt Base			
7,365.0	7,365.0	Opeche Salt			
7,444.0	7,444.0	Opeche Salt Base			
7,625.0	7,625.0	Broom Creek (Top of Minnelusa Gp.)			
7,668.0	7,668.0	Amsden			
7,844.0	7,844.0	Tyler			
8,031.0	8,031.0	Otter (Base of Minnelusa Gp.)			
8,365.0	8,365.0	Kibbey			
8,512.0	8,512.0	Charles Salt			
9,135.0	9,135.0	UB			
9,212.0	9,212.0	Base Last Salt			
9,260.0	9,260.0	Ratcliffe			
9,436.0	9,436.0	Mission Canyon			
10,010.0	10,010.0	Lodgepole			
10,160.0	10,160.0	Lodgepole Fracture Zone			
10,832.3	10,716.0	False Bakken			
10,858.7	10,725.0	Upper Bakken			
10,919.9	10,740.0	Middle Bakken			
10,998.5	10,747.0	Middle Bakken Sand Target			

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates +N/-S (ft)	Local Coordinates +E/-W (ft)	Comment
10,306.3	10,306.3	0.0	0.0	KOP - Start Build 13.00
10,998.6	10,747.0	358.0	-257.1	EOC - Start 101.0 hold at 10998.6 MD
11,099.5	10,747.0	440.0	-316.0	Start DLS 2.00 TFO 90.00
12,883.8	10,747.0	2,111.1	-853.9	Start 7938.9 hold at 12883.8 MD
20,822.7	10,747.0	10,050.0	-854.0	TD at 20822.7

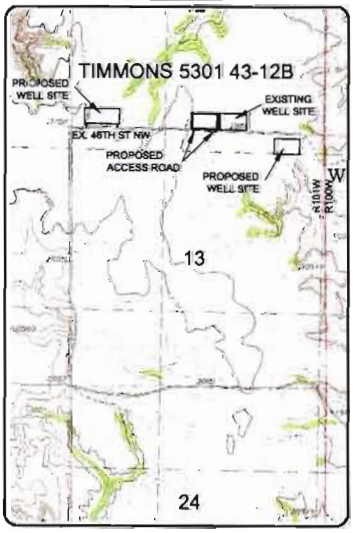
SECTION BREAKDOWN

OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 1500 HOUSTON, TX 77002
"TIMMONS 5301 43-12B"
250 FEET FROM SOUTH LINE AND 2410 FEET FROM EAST LINE
SECTIONS 1 & 12, T153N, R101W, 5TH P.M., MCKENZIE COUNTY, NORTH DAKOTA



MONUMENT – RECOVERED
MONUMENT – NOT RECOVERED

VICINITY MAP



ALL BEARINGS ARE BASED ON G.P.S. DERIVED BEARINGS. THE ORIGINAL SURVEY OF THIS AREA FOR THE GENERAL LAND OFFICE (G.L.O.) WAS 1900. THE CORNERS FOUND ARE AS INDICATED AND ALL OTHERS ARE COMPUTED FROM THOSE CORNERS FOUND AND BASED ON G.L.O. DATA.

NORTH DAKOTA
1222
1/20/12
REGISTERED
LAND SURVEYOR

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www.iengi.com
Other offices in Minnesota, North Dakota and South Dakota

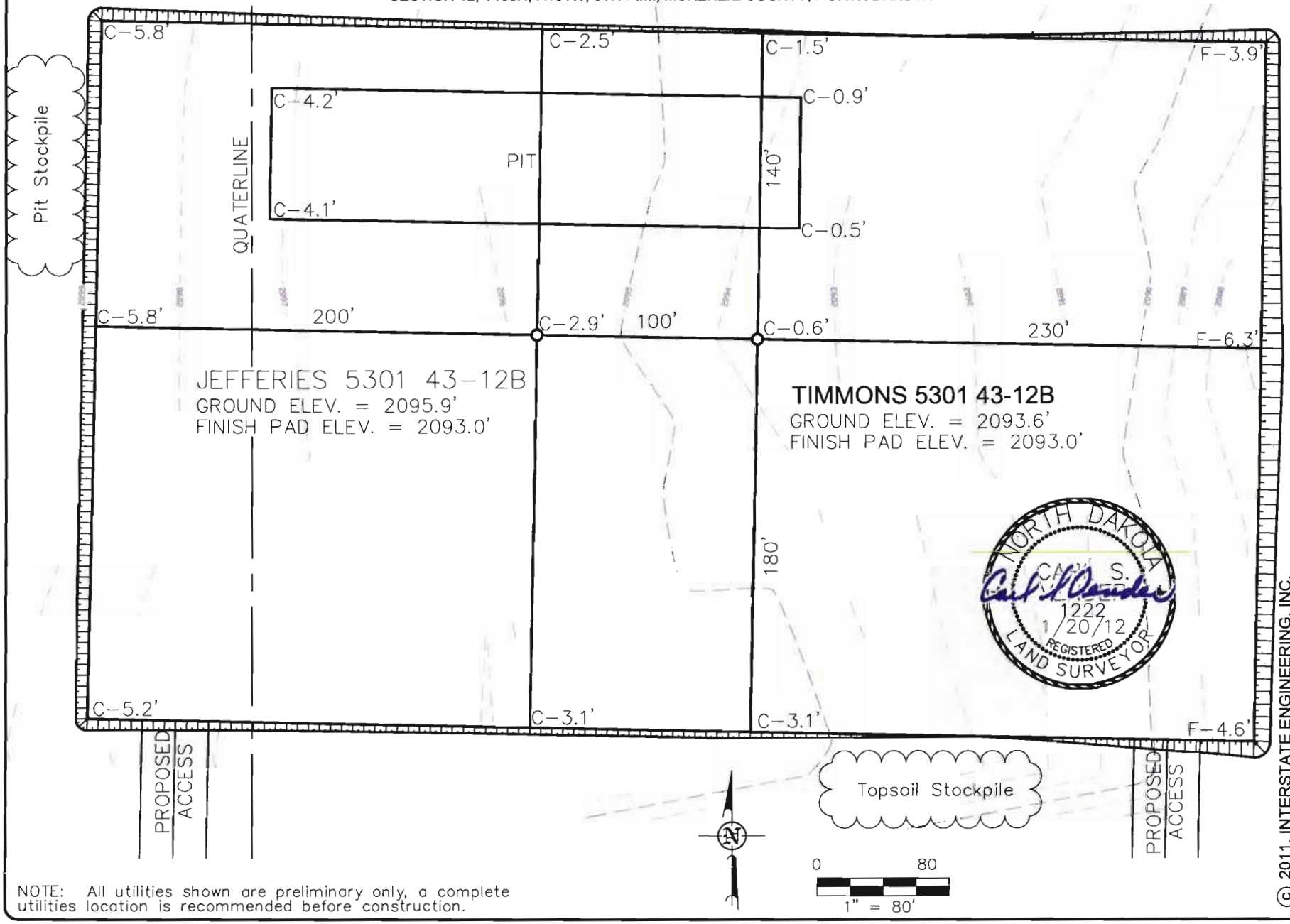
OASIS PETROLEUM NORTH AMERICA, LLC
SECTION BREAKDOWN
SECTIONS 1 & 12, T153N, R101W
MCKENZIE COUNTY, NORTH DAKOTA

Drawn By: J.J.S. Project No.: 311-09-361
Checked By: C.S.V. Date: DEC 2011

Revision No.	Date	By	Description
REV 1	1/19/12	JJS	SWAPPED WELL LOCATIONS

PAD LAYOUT

OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 1500 HOUSTON, TX 77002
"TIMMONS 5301 43-12B"
250 FEET FROM SOUTH LINE AND 2410 FEET FROM EAST LINE
SECTION 12, T153N, R101W, 5TH P.M., MCKENZIE COUNTY, NORTH DAKOTA



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

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Revision No.	Date	By	Description
REV 1	1/16/12	JJS	SWAPPED WELL LOCATIONS

OASIS PETROLEUM NORTH AMERICA, LLC
PAD LAYOUT
SECTION 12, T153N, R101W
MCKENZIE COUNTY, NORTH DAKOTA

Drawn By: J.J.S. Project No.: S11-9-361
Checked By: C.S.V. Date: DEC 2011

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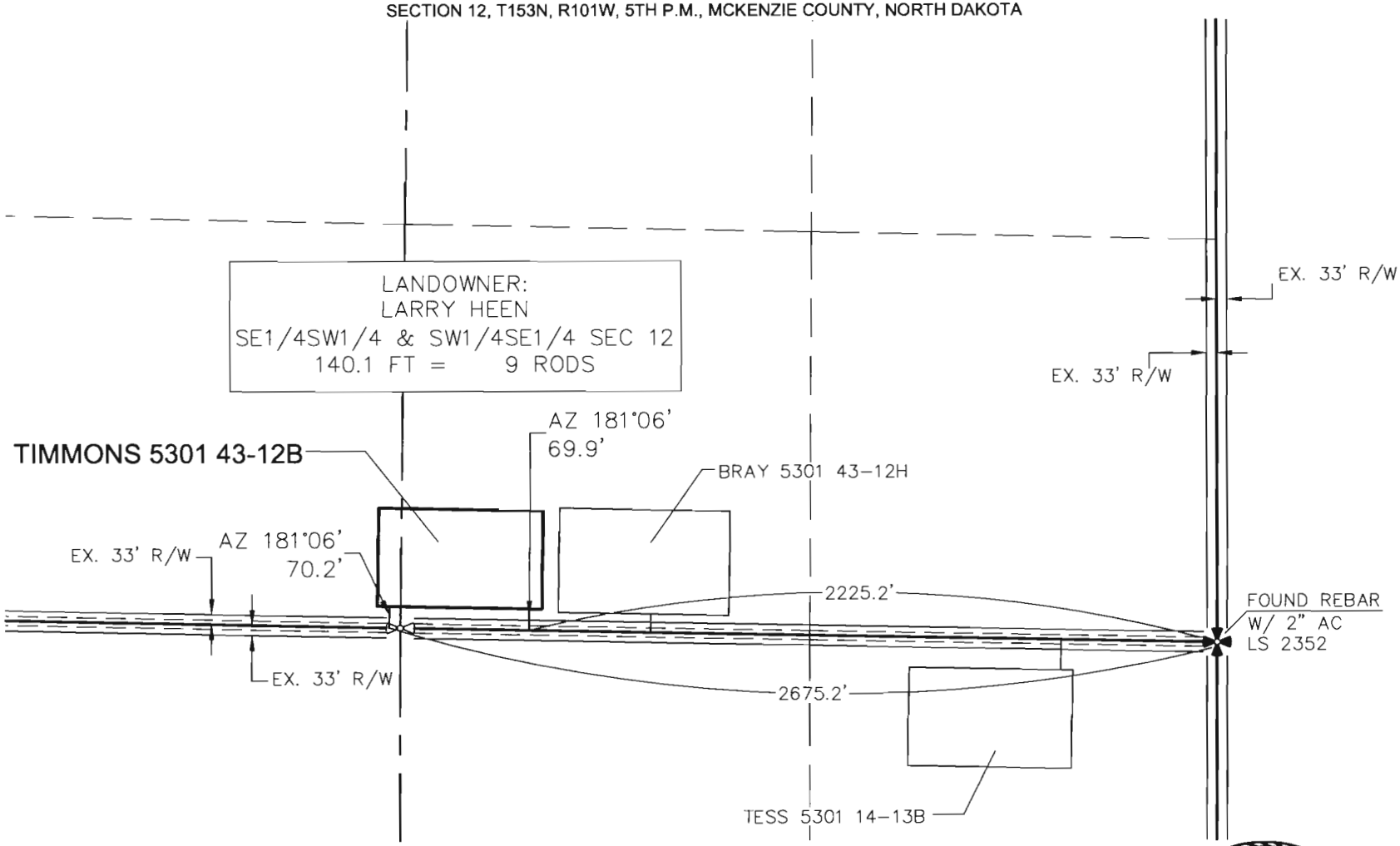
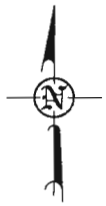
SHEET NO. 3/8

ACCESS APPROACH

OASIS PETROLEUM NORTH AMERICA. LLC
1001 FANNIN, SUITE 1500 HOUSTON, TX 77002
"TIMMONS 5301 43-12B"
250 FEET FROM SOUTH LINE AND 2410 FEET FROM EAST LINE
SECTION 12, T153N, R101W, 5TH P.M., MCKENZIE COUNTY, NORTH DAKOTA





0 500
1" = 500'

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

NORTH DAKOTA
CARL S. ADAMS
1222
1/20/12
REGISTERED
LAND SURVEYOR

Revision No.	Date	By	Description
REV 1	1/16/12	JJS	SWAPPED WELL LOCATIONS

OASIS PETROLEUM NORTH AMERICA, LLC
ACCESS APPROACH
SECTION 12, T153N, R101W
MCKENZIE COUNTY, NORTH DAKOTA

Drawn By: J.J.S. Project No.: S11-09-361
Checked By: C.S.V. Date: DEC 2011

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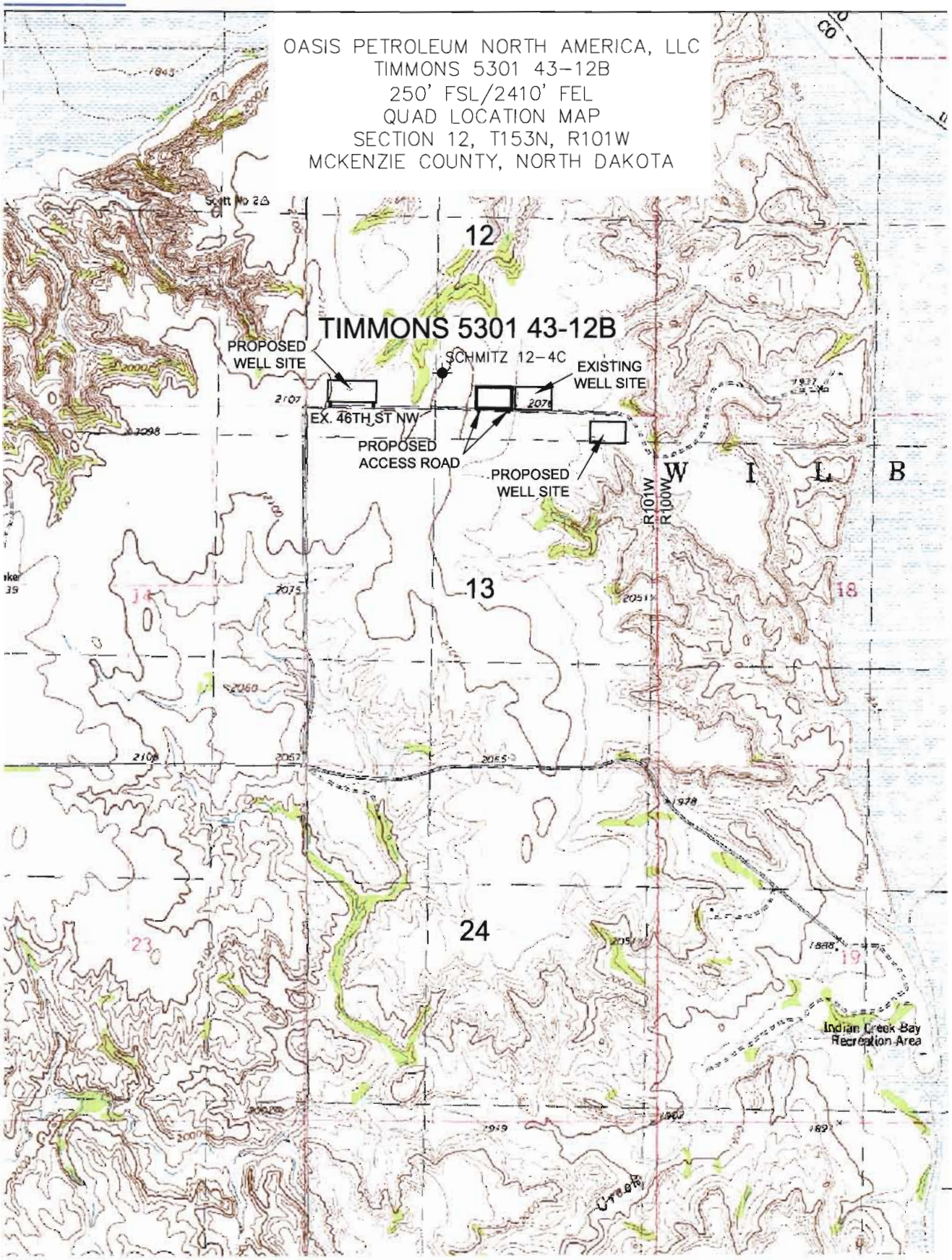

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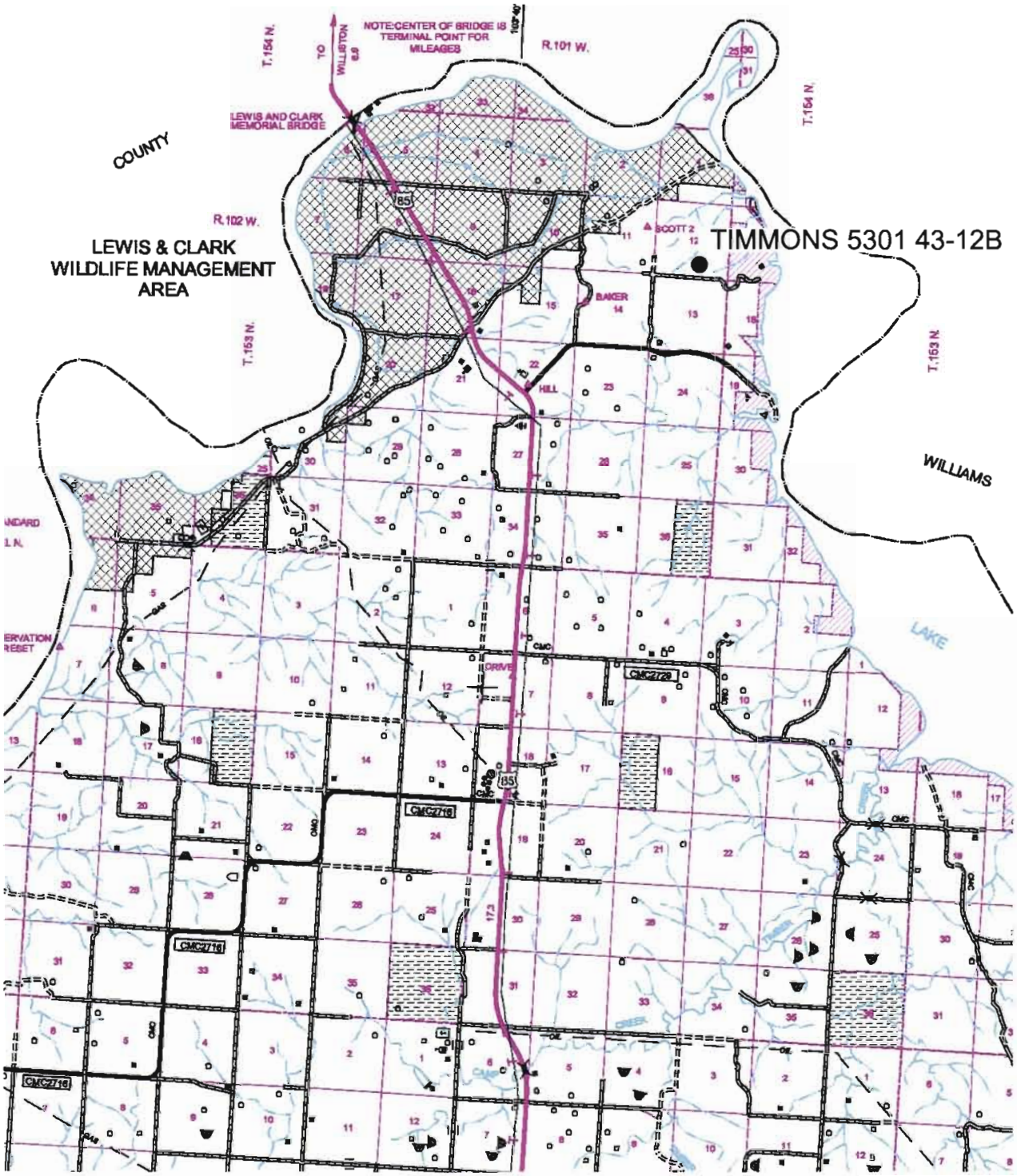
OASIS PETROLEUM NORTH AMERICA, LLC
QUAD LOCATION MAP
SECTION 12, T153N, R101W
MCKENZIE COUNTY, NORTH DAKOTA

Drawn By: J.J.S. | Project No.: S11-09-361
Checked By: C.S.V. | Date: DEC 2011

Revision No.	Date	By	Description
REV 1	1/19/12	JJS	SWAPPED WELL LOCATIONS

COUNTY ROAD MAP

OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 1500 HOUSTON, TX 77002
"TIMMONS 5301 43-12B"
250 FEET FROM SOUTH LINE AND 2410 FEET FROM EAST LINE
SECTION 12, T153N, R101W, 5TH P.M., MCKENZIE COUNTY, NORTH DAKOTA



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SCALE: 1" = 2 MILE

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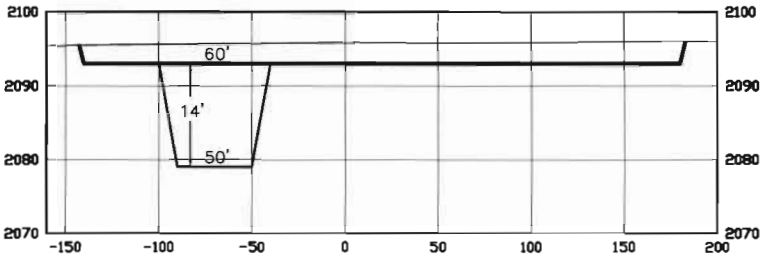
OASIS PETROLEUM NORTH AMERICA, LLC
COUNTY ROAD MAP
SECTION 12, T153N, R101W
MCKENZIE COUNTY, NORTH DAKOTA

Drawn By: J.J.S. Project No.: S11-09-361
Checked By: C.S.V. Date: DEC 2011

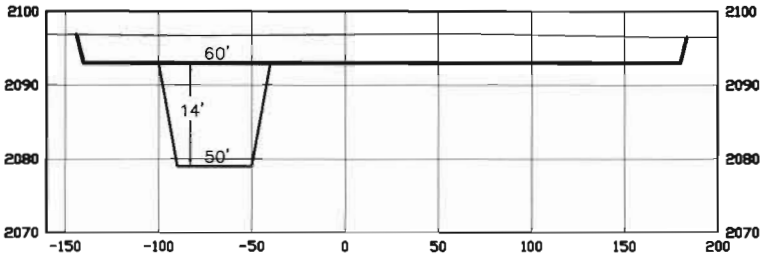
Revision No.	Date	By	Description
REV 1	1/19/12	JJS	SWAPPED WELL LOCATIONS

CROSS SECTIONS

OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 1500 HOUSTON, TX 77002
"TIMMONS 5301 43-12B"
250 FEET FROM SOUTH LINE AND 2410 FEET FROM EAST LINE
SECTION 12, T153N, R101W, 5TH P.M., MCKENZIE COUNTY, NORTH DAKOTA

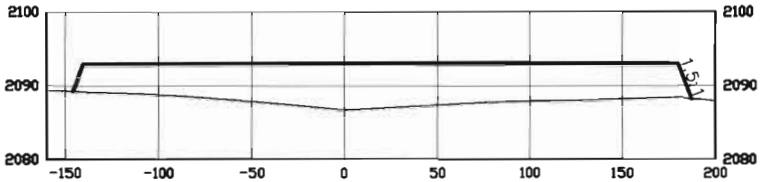


STA. 2+00



STA. 1+00

STA. 0+00



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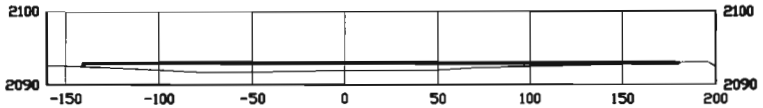
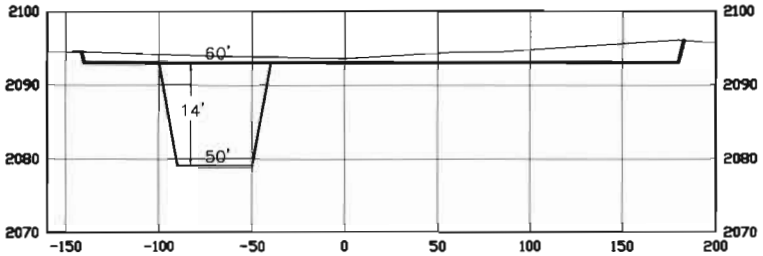


STA. 4+00



STA. 3+00

SCALE
HORIZ 1'=100'
VERT 1'=20'

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Revision No.	Date	By	Description
REV 1	1/19/12	LJS	SHIFTED WELL LOCATIONS

OASIS PETROLEUM NORTH AMERICA, LLC
PAD CROSS SECTIONS
SECTION 12, T153N, R101W
MCKENZIE COUNTY, NORTH DAKOTA

Drawn By: J.J.S. Project No.: S11-9-361
Checked By: C.S.V. Date: DEC 2011

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WELL LOCATION SITE QUANTITIES

OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 1500 HOUSTON, TX 77002
"TIMMONS 5301 43-12B"
250 FEET FROM SOUTH LINE AND 2410 FEET FROM EAST LINE
SECTION 12, T153N, R101W, 5TH P.M., MCKENZIE COUNTY, NORTH DAKOTA

WELL SITE ELEVATION	2093.6
WELL PAD ELEVATION	2093.0

EXCAVATION	12,909
PLUS PIT	3,150
	16,059
EMBANKMENT	4,705
PLUS SHRINKAGE (30%)	1,412
	6,117
STOCKPILE PIT	3,150
STOCKPILE TOP SOIL (6")	3,284
STOCKPILE FROM PAD	3,508
DISTURBED AREA FROM PAD	4.07 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
2410' FEL
250' FSL

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OASIS PETROLEUM NORTH AMERICA, LLC
QUANTITIES
SECTION 12, T153N, R101W
MCKENZIE COUNTY, NORTH DAKOTA

Drawn By: J.J.S. Project No.: S11-09-361
Checked By: C.S.V. Date: DEC 2011

Revision No.	Date	By	Description
REV 1	1/19/12	JJS	SWAPPED WELL LOCATIONS

Oil and Gas Division 22221

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

Department of Mineral Resources

Lynn D. Helms - Director

North Dakota Industrial Commission

www.oilgas.nd.gov

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

Date: **1/19/2012**

RE: CORES AND SAMPLES

Well Name: **TIMMONS 5301 43-12B** Well File No.: **22221**
Location: **SWSE 12-153-101** County: MCKENZIE
Permit Type: **Development - HORIZONTAL**
Field: **BAKER** Target Horizon: BAKKEN

Dear ROBIN E. HESKETH:

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

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

2) Samples shall include all cuttings from:

Base of the Last Charles Salt

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

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

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

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

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

Sincerely

Richard A. Suggs
Geologist

Oil and Gas Division

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

Department of Mineral Resources

Lynn D. Helms - Director

North Dakota Industrial Commission

www.oilgas.nd.gov

January 10, 2012

Kaitlin Bass
Operations Assistant
OASIS PETROLEUM NORTH AMERICA LLC
1001 Fannin Suite 1500
Houston, TX 77002

RE: HORIZONTAL WELL
TIMMONS 5301 43-12B
SWSE Section 12-153N-101W
McKenzie County
Well File # 22221

Dear Kaitlin:

Pursuant to Commission Order No. 18012, 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 **200' setback** from the north & south boundaries and **500' setback** from the east & west boundaries within the 1280 acre spacing unit consisting of Sections 12 & 1-T153N-R101W.

PERMIT STIPULATIONS: OASIS PETRO NO AMER must contact NDIC Field Inspector Marc Binns at 701-220-5989 prior to location construction. A CLOSED MUD SYSTEM IS REQUIRED ON MULTI-WELL PADS, ALTHOUGH THE DISPOSAL OF DRILL CUTTINGS IS CONTINGENT UPON SITE SPECIFIC CONDITIONS TO BE DETERMINED BY AN NDIC FIELD INSPECTOR.

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. The minimum legal coordinates from the well head at casing point is: 50'S & 2010' E. Also, based on the azimuth of the proposed lateral the maximum legal coordinates from the well head is: 2010' E & 10054' N.

Location Construction Commencement (Three Day Waiting Period)

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

Permit Fee & Notification

Payment was received in the amount of $100 via credit card .The permit fee has been received. It is requested that notification be given immediately upon the spudding of the well. This information should be relayed to the Oil & Gas Division, Bismarck, via telephone. The following information must be included: Well name, legal location, permit number, drilling contractor, company representative, date and time of spudding. Office hours are

8:00 a.m. to 12:00 p.m. and 1:00 p.m. to 5:00 p.m. Central Time. Our telephone number is (701) 328-8020, leave a message if after hours or on the weekend.

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

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

Reserve pit

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

Surface casing cement

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

Logs

NDAC Section 43-02-03-31 requires the running of a Cement Bond Log from which the presence of cement can be determined in every well in which production or intermediate casing has been set and a Gamma Ray Log must be run from total depth to ground level elevation of the well bore. All logs must be submitted as one paper copy and one digital copy in LAS (Log ASCII) format, or a format approved by the Director. Image logs that include, but are not limited to, Mud Logs, Cement Bond Logs, and Cyberlook Logs, cannot be produced in their entirety as LAS (Log ASCII) files. To create a solution and establish a standard format for industry to follow when submitting image logs, the Director has given approval for the operator to submit an image log as a TIFF (*.tif) formatted file. The TIFF (*.tif) format will be accepted only when the log cannot be produced in its entirety as a LAS (Log ASCII) file format. The digital copy may be submitted on a 3.5" floppy diskette, a standard CD, or attached to an email sent to digitallogs@nd.gov
Thank you for your cooperation.

Sincerely,

David Tabor
Engineering Technician IV

APPLICATION FOR PERMIT TO DRILL HORIZONTAL WELL - FORM 1H

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

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

Type of Work	Type of Well	Approximate Date Work Will Start	Confidential Status
New Location	Oil & Gas	1 / 25 / 2012	No

Operator	Telephone Number
OASIS PETROLEUM NORTH AMERICA LLC	281-404-9461

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

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

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

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

Well Name	Well Number
TIMMONS	5301 43-12B

Surface Footages	Qtr-Qtr	Section	Township	Range	County
250 F S L 2510 F E L	SWSE	12	153 N	101 W	McKenzie

Longstring Casing Point Footages	Qtr-Qtr	Section	Township	Range	County
631 F N L 2517 F W L	SESW	12	153 N	101 W	McKenzie

Longstring Casing Point Coordinates From Well Head	Azimuth	Longstring Total Depth
381 N From WH 253 W From WH	326.4 º	11015 Feet MD 10747 Feet TVD

Bottom Hole Footages From Nearest Section Line	Qtr-Qtr	Section	Township	Range	County
200 F N L 2000 F W L	LOT2	1	153 N	101 W	McKenzie

Bottom Hole Coordinates From Well Head	KOP Lateral 1	Azimuth Lateral 1	Estimated Total Depth Lateral 1
10054 N From WH 770 W From WH	10306 Feet MD	360 º	20794 Feet MD 10747 Feet TVD

Latitude of Well Head	Longitude of Well Head	NAD Reference	Description of (Subject to NDIC Approval)
48 ° 04 ' 58.07 "	-103 ° 36 ' 51.83 "	NAD83	SPACING UNIT: Sections 12 & 1-T153N-R101W

Ground Elevation	Acres in Spacing/Drilling Unit	Spacing/Drilling Unit Setback Requirement	Industrial Commission Order
2096 Feet Above S.L.	1280	200 Feet N/S 500 Feet E/W	18012

North Line of Spacing/Drilling Unit	South Line of Spacing/Drilling Unit	East Line of Spacing/Drilling Unit	West Line of Spacing/Drilling Unit
5280 Feet	5278 Feet	10443 Feet	10497 Feet

Objective Horizons	Pierre Shale Top
BAKKEN	1968

Proposed	Size	Weight	Depth	Cement Volume	
Surface Casing	9 - 5/8 "	36 Lb./Ft.	2070 Feet	616 Sacks	NOTE: Surface hole must be drilled with fresh water and surface casing must be cemented back to surface.

Proposed	Size	Weight(s)	Longstring Total Depth	Cement Volume	Cement Top	Top Dakota Sand
Longstring Casing	7 - "	29&32 Lb./Ft.	11015 Feet MD 10747 Feet TVD	732 Sacks	4961 Feet	5461 Feet

Base Last Charles Salt (If Applicable)	
9212 Feet	NOTE: Intermediate or longstring casing string must be cemented above the top Dakota Group Sand.

Proposed Logs
CBL/GR-TOC/GR-BSC

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

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

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

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

Email Attachments: Drill plan with drilling fluid data, Well Summary with Csg/Cmt design, Direct Plan/Plot, and Plats

Lateral 2

KOP Lateral 2 Feet MD	Azimuth Lateral 2 °	Estimated Total Depth Lateral 2 Feet MD / Feet TVD	KOP Coordinates From Well Head From WH / From WH
Formation Entry Point Coordinates From Well Head From WH / From WH	Bottom Hole Coordinates From Well Head From WH / From WH		

KOP Footages From Nearest Section Line	Qtr-Qtr	Section	Township	Range	County
F L F L			N	W	
Bottom Hole Footages From Nearest Section Line	**Qtr-Qtr**	**Section**	**Township**	**Range**	**County**
F L F L			N	W	

Lateral 3

KOP Lateral 3 Feet MD	Azimuth Lateral 3 °	Estimated Total Depth Lateral 3 Feet MD / Feet TVD	KOP Coordinates From Well Head From WH / From WH
Formation Entry Point Coordinates From Well Head From WH / From WH	Bottom Hole Coordinates From Well Head From WH / From WH		

KOP Footages From Nearest Section Line	Qtr-Qtr	Section	Township	Range	County
F L F L			N	W	
Bottom Hole Footages From Nearest Section Line	**Qtr-Qtr**	**Section**	**Township**	**Range**	**County**
F L F L			N	W	

Lateral 4

KOP Lateral 4 Feet MD	Azimuth Lateral 4 °	Estimated Total Depth Lateral 4 Feet MD / Feet TVD	KOP Coordinates From Well Head From WH / From WH
Formation Entry Point Coordinates From Well Head From WH / From WH	Bottom Hole Coordinates From Well Head From WH / From WH		

KOP Footages From Nearest Section Line	Qtr-Qtr	Section	Township	Range	County
F L F L			N	W	
Bottom Hole Footages From Nearest Section Line	**Qtr-Qtr**	**Section**	**Township**	**Range**	**County**
F L F L			N	W	

Lateral 5

KOP Lateral 5 Feet MD	Azimuth Lateral 5 °	Estimated Total Depth Lateral 5 Feet MD / Feet TVD	KOP Coordinates From Well Head From WH / From WH
Formation Entry Point Coordinates From Well Head From WH / From WH	Bottom Hole Coordinates From Well Head From WH / From WH		

KOP Footages From Nearest Section Line	Qtr-Qtr	Section	Township	Range	County
F L F L			N	W	
Bottom Hole Footages From Nearest Section Line	**Qtr-Qtr**	**Section**	**Township**	**Range**	**County**
F L F L			N	W	

I hereby swear or affirm the information provided is true, complete and correct as determined from all available records.		Date 1 / 6 / 2012
ePermit	Printed Name **Kaitlin Bass**	Title **Operations Assistant**

FOR STATE USE ONLY

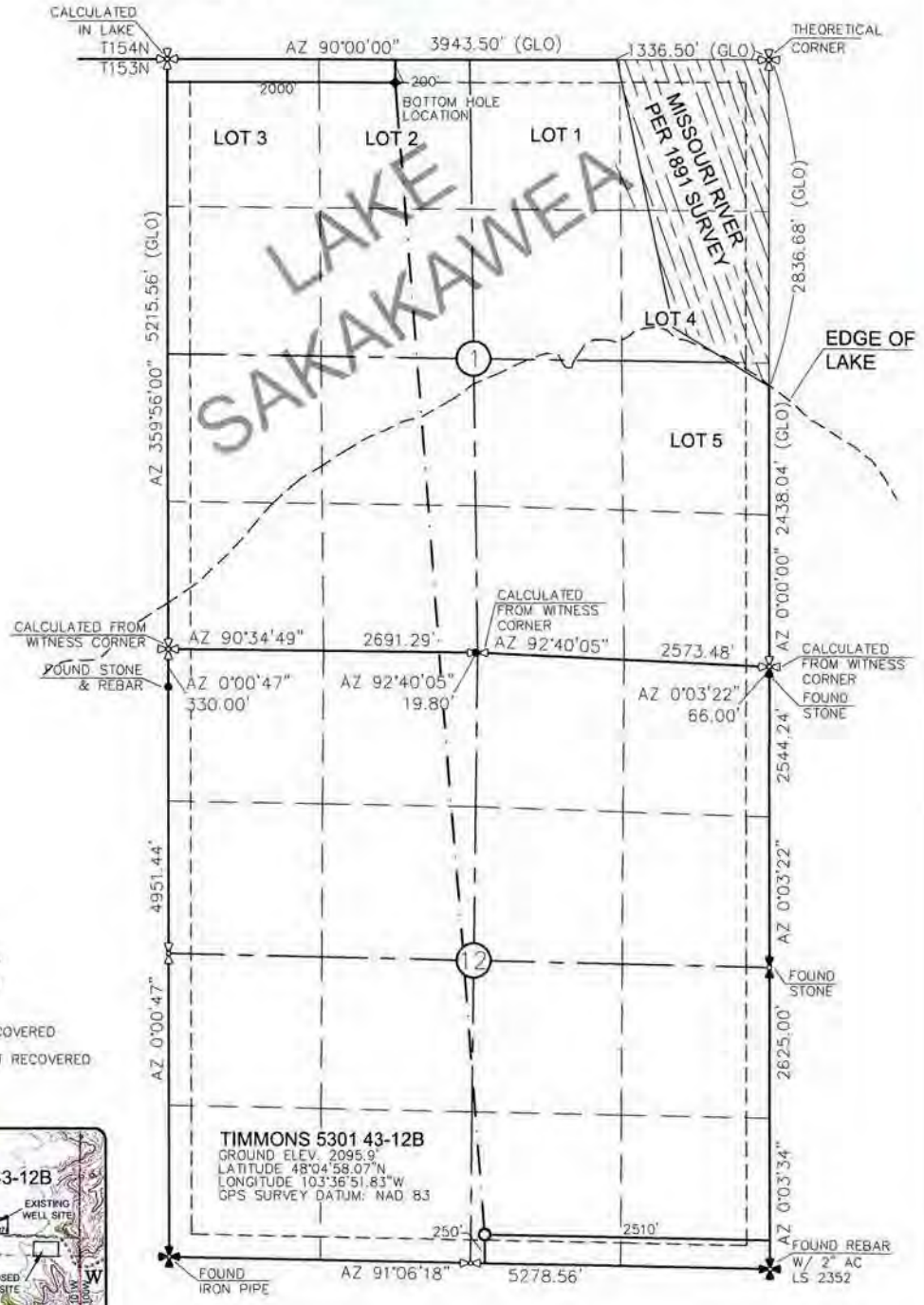
Permit and File Number	API Number
22221	**33 - 053 - 03937**
Field **BAKER**	
Pool **BAKKEN**	Permit Type **DEVELOPMENT**

FOR STATE USE ONLY

Date Approved
1 / 10 / 2012
By **David Tabor**
Title **Engineering Technician IV**

WELL LOCATION PLAT

OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 1500 HOUSTON, TX 77002
"TIMMONS 5301 43-12B"
250 FEET FROM SOUTH LINE AND 2510 FEET FROM EAST LINE
SECTION 12, T153N, R101W, 5TH P.M., MCKENZIE COUNTY, NORTH DAKOTA



VICINITY MAP

STAKED ON 12/6/11
VERTICAL CONTROL DATUM WAS BASED UPON CONTROL POINT 13 WITH AN ELEVATION OF 2090.8'

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

CARL S. VENDER LS 1222

NORTH DAKOTA CARL S. VENDER 1222 12/7/11 REGISTERED LAND SURVEYOR

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1/8
SHEET NO.

INTERSTATE ENGINEERING
Professionals you need, people you trust

Interstate Engineering, Inc.
P.O. Box 648
425 East Main Street
Sidney, Montana 59270
Ph (406) 433-5617
Fax (406) 433-5618
www.iengi.com
Other offices in Minnesota, North Dakota and South Dakota

OASIS PETROLEUM NORTH AMERICA, LLC
WELL LOCATION PLAT
SECTION 12, T153N, R101W
MCKENZIE COUNTY, NORTH DAKOTA

Drawn By: J.J.S. | Project No.: S11-09-361
Checked By: C.S.V. | Date: DEC 2011

Revision No.	Date	By	Description

Oasis Petroleum
Well Summary
Timmons 5103 43-12B
Section 12 T153N R101W
McKenzie County, ND

SURFACE CASING AND CEMENT DESIGN

							Make-up Torque (ft-lbs)		
Size	**Interval**	**Weight**	**Grade**	**Coupling**	**I.D.**	**Drift**	**Minimum**	**Optimum**	**Max**
9-5/8”	0’ to 2,070’	36	J-55	LTC	8.921"	8.765"	3400	4530	5660

Interval	**Description**	**Collapse**	**Burst**	**Tension**	**Cost per ft**
		(psi) a	(psi) b	(1000 lbs) c	
0’ to 2,070’	9-5/8", 36#, J-55, LTC, 8rd	2020 / 2.08	3520 / 3.63	453 / 2.75	

API Rating & Safety Factor

a) Based on full casing evacuation with 9.0 ppg fluid on backside.
b) Burst pressure based on 9 ppg fluid with no fluid on backside.
c) Based on string weight in 9.0 ppg fluid at 2,070’ TVD plus 100k# overpull. (Buoyed weight equals 64k lbs.)

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

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

Lead Slurry: **416 sks** (220 bbls) 11.5 lb/gal VARICEM CEMENT with 0.25 lb/sk Poly-E-Flake (lost circulation additive)

Tail Slurry: **200 sks** (72 bbls) 13 lb/gal VARICEM CEMENT with 0.25 lb/sk Poly-E-Flake (lost circulation additive)

Oasis Petroleum
Well Summary
Timmons 5103 43-12B
Section 12 T153N R101W
McKenzie County, ND

INTERMEDIATE CASING AND CEMENT DESIGN

Intermediate Casing Design

							Make-up Torque (ft-lbs)		
Size	**Interval**	**Weight**	**Grade**	**Coupling**	**I.D.**	**Drift**	**Minimum**	**Optimum**	**Max**
7”	0’ – 6,750’	29	P-110	LTC	6.184”	6.059”	5,980	7,970	8,770
7”	6,750’ – 10,306’ (KOP)	32	HCP-110	LTC	6.094”	6.000”**	6,730	8,970	9,870
7”	10,306’ – 11,015’	29	P-110	LTC	6.184”	6.059”	5,980	7,970	8,770

**Special Drift

Interval	Length	Description	Collapse	Burst	Tension
			(psi) a	(psi) b	(1000 lbs) c
0’ – 6,750’	6,750’	7”, 29#, P-110, LTC, 8rd	8,530 / 2.43*	11,220 / 1.19	797 / 2.09
6,750’ – 10,306’	3,556’	7”, 32#, HCP-110, LTC, 8rd	11,820 / 2.20*	12,460 / 1.29	
6,750’ – 10,306’	3,556’	7”, 32#, HCP-110, LTC, 8rd	11,820 / 1.05**	12,460 / 1.29	
10,306’ – 11,015’	709’	7”, 29 lb, P-110, LTC, 8rd	8,530 / 1.52*	11,220 / 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 9,000 psig max press for stimulation plus 10.2 ppg fluid in casing and 9.0 ppg fluid on backside—to 10,747’ 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.

Pre-flush (Spacer): **100 bbls** Saltwater
70 sks Pozmix A
20 bbls Fresh Water

Lead Slurry: **110 sks** (50 bbls) 11.8 lb/gal ECONOCEM SYSTEM with 0.3% Fe-2 (additive material) and 0.25 lb/sk Poly-E-Flake (lost circulation additive)

Primary Slurry: **347 sks** (86 bbls) 14 lb/gal EXTENDACEM SYSTEM with 0.6% HR-5 (retarder) and 0.25 lb/sk Poly-E-Flake (lost circulation additive)

Tail Slurry: **275 sks** (77 bbls) 15.6 lb/gal HALCEM SYSTEM with 0.2% HR-5 (retarder), 0.25 lb/sk Poly-E-Flake (lost circulation additive) and 35% SSA-1 (additive material)

Oasis Petroleum
Well Summary
Timmons 5103 43-12B
Section 12 T153N R101W
McKenzie County, ND

PRODUCTION LINER

							Make-up Torque (ft-lbs)		
Size	**Interval**	**Weight**	**Grade**	**Coupling**	**I.D.**	**Drift**	**Minimum**	**Optimum**	**Max**
4-1/2”	10,260’ to 20,794’	11.6	P-110	BTC	4.000"	3.875"			

Interval	Description	Collapse	Burst	Tension	Cost per ft
		(psi) **a**	(psi) **b**	(1000 lbs) **c**	
10,260’ to 20,794’	4-1/2”, 11.6 lb, P-110, BTC	7,560 / 1.42	10,690 / 1.105	279 / 1.36	$13.25

API Rating & Safety Factor

a) Based on full casing evacuation with 9.5 ppg fluid on backside @ 10,747’ TVD.
b) Burst pressure based on 9,000 psi Stimulation pressure with 10.2 ppg internal fluid gradient with 9.0 ppg gradient on backside @ 10,747’ TVD.
c) Based on string weight in 9.5 ppg fluid (Buoyed weight: 104k lbs.) plus 100k lbs overpull.

DRILLING PLAN

OPERATOR	Oasis Petroleum	**COUNTY/STATE**	McKenzie Co., ND
WELL NAME	Timmons 5103 43-12B	**RIG**	Nabors 149
WELL TYPE	Horizontal Middle Bakken		
LOCATION	Sec. 12 T153N R101W Surface Location (survey plat): 250' fsl	2,510' fel	
EST. T.D.	20,794'	**GROUND ELEV:**	2093 Finished Pad Elev. **Sub Height:** 25
	TOTAL LATERAL: 9,779' (est)	**KB ELEV:**	2118

PROGNOSIS: Based on 2,118' KB(est)

MARKER		DEPTH (Surf Loc)	DATUM (Surf Loc)
Pierre	NDIC MAP	1,968	150
Greenhorn		4,634	(2,516)
Mowry		5,030	(2,912)
Dakota		5,461	(3,343)
Rierdon		6,377	(4,259)
Dunham Salt		6,896	(4,778)
Dunham Salt Base		6,963	(4,845)
Spearfish		6,968	(4,850)
Pine Salt		7,212	(5,094)
Pine Salt Base		7,337	(5,219)
Opeche Salt		7,365	(5,247)
Opeche Salt Base		7,444	(5,326)
Broom Creek (Top of Minnelusa Gp.)		7,625	(5,507)
Amsden		7,668	(5,550)
Tyler		7,844	(5,726)
Otter (Base of Minnelusa Gp.)		8,031	(5,913)
Kibbey		8,365	(6,247)
Charles Salt		8,512	(6,394)
UB		9,135	(7,017)
Base Last Salt		9,212	(7,094)
Ratcliffe		9,260	(7,142)
Mission Canyon		9,436	(7,318)
Lodgepole		10,010	(7,892)
Lodgepole Fracture Zone		10,160	(8,042)
False Bakken		10,716	(8,598)
Upper Bakken		10,725	(8,607)
Middle Bakken		10,740	(8,622)
Middle Bakken Sand Target		10,747	(8,629)
Base Middle Bakken Sand Target		10,756	(8,638)
Lower Bakken		10,776	(8,658)
Three Forks		10,803	(8,685)

Dip Rate: Variable 2.36° to -0.71°

LOGS:

	Type	Interval
OH Logs:	Infill-well no logs planned.	
CBL/GR:	Above top of cement/GR to base of casing	
MWD GR:	KOP to lateral TD	

DEVIATION:

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

DST'S: None planned

CORES: None planned

MUDLOGGING:

Two-Man: 8,312'

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

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

BOP: 11" 5000 psi blind, pipe & annular

Max. Anticipated BHP: 4669

Surface Formation: *Glacial till*

MUD:	Interval		Type	WT	Vis	WL	Remarks
Surface	0' -	2,070'	FW/Gel - Lime Sweeps	8.6 - 8.9	28-34	NC	Circ Mud Tanks
Intermediate	2,070' -	11,015'	Invert	9.6-10.4	40-60	30+(HpHt)	Circ Mud Tanks
Liner	11,015' -	20,794'	Salt Water	9.3-10.4	28-34	NC	Circ Mud Tanks

CASING:	Size	Wt ppf	Hole	Depth		Cement	WOC	Remarks
Surface:	9-5/8"	36#	13-1/2"	2,070'		To Surface	12	100' into Pierre
Intermediate:	7"	29/32#	8-3/4"	11,015'		4,961'	24	500' above Dakota
Production:	4.5"	11.6#	6"	20,794'	TOL @ 10,260'			50' above KOP

PROBABLE PLUGS, IF REQ'D:

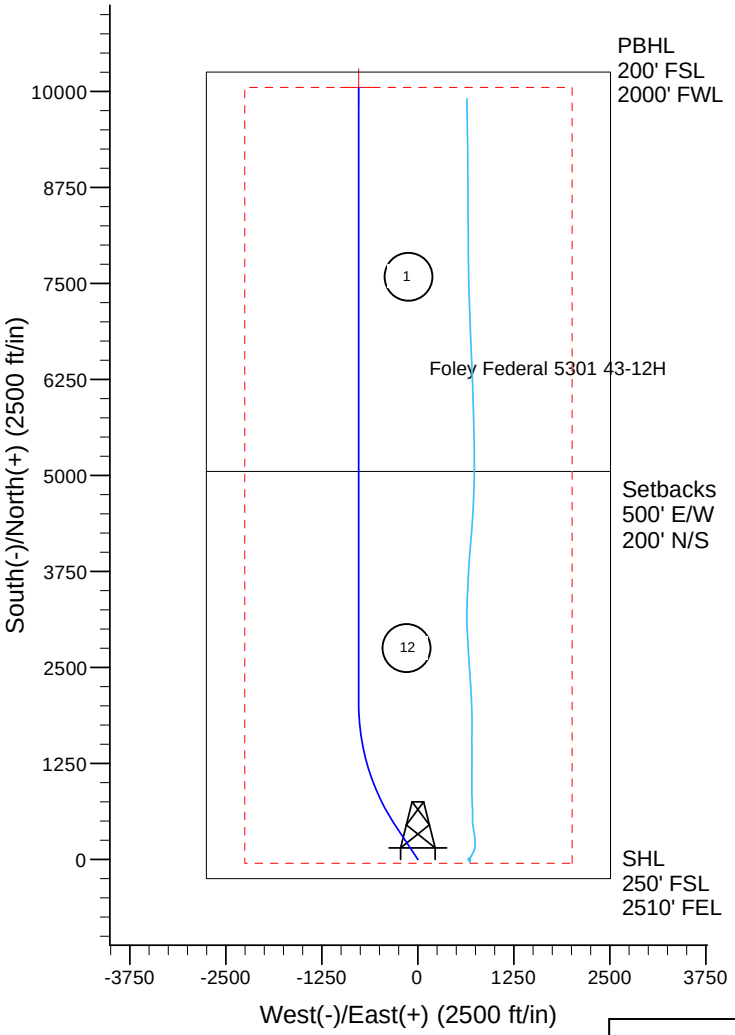
OTHER:

	MD	TVD	FNL/FSL	FEL/FWL	S-T-R	AZI
Surface:	2,070'	2,070'	250' FSL	2510' FEL	12-T153N-R101W	Survey Company:
KOP:	10,306'	10,306'	250' FSL	2510' FEL	12-T153N-R101W	Build Rate: 13 deg /100'
EOC:	10,999'	10,747'	617' FSL	2526' FWL	12-T153N-R101W	326.4
Casing Point:	11,015'	10,747'	631' FSL	2517' FWL	12-T153N-R101W	326.4
Middle Bakken Lateral TD:	20,794'	10,747'	200' FNL	2000' FWL	1-T153N-R101W	0.0

Comments:

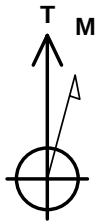
DRILL TO KOP.
DRILL CURVE TO 90 DEG AND 7" CASING POINT
SET 7" CASING. DRILL MIDDLE BAKKEN LATERAL.
MWD Surveys will be taken every 100' in vertical hole, and a minimum of every 30' while building curve and every 90' while drilling lateral.
MWD GR to be run from KOP to Lateral TD.
GR must be run to ground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

Geology: SPG 12-27-2011 **Engineering:** L. Strong 1/6/2012



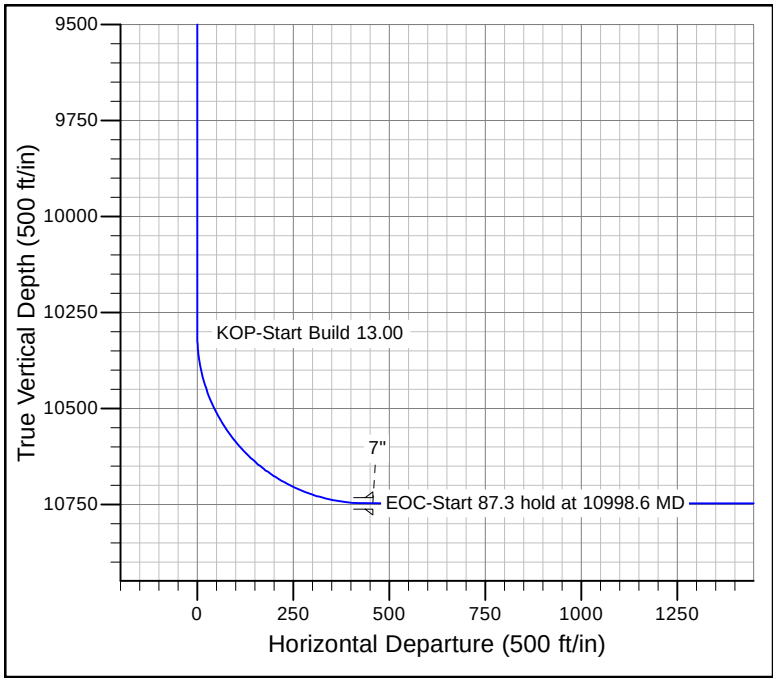
SITE DETAILS: 153N-101W-1/12	
Site Centre Latitude:	48° 4' 57.940 N
Longitude:	103° 36' 41.780 W
Positional Uncertainity:	0.0
Convergence:	-2.32
Local North:	True

Project: Indian Hills
Site: 153N-101W-1/12
Well: Timmons 5301 43-12B
Wellbore: OH
Design: Plan #1



Azimuths to True North
Magnetic North: 8.55°

Magnetic Field
Strength: 56719.2snT
Dip Angle: 73.09°
Date: 12/27/2011
Model: IGRF200510

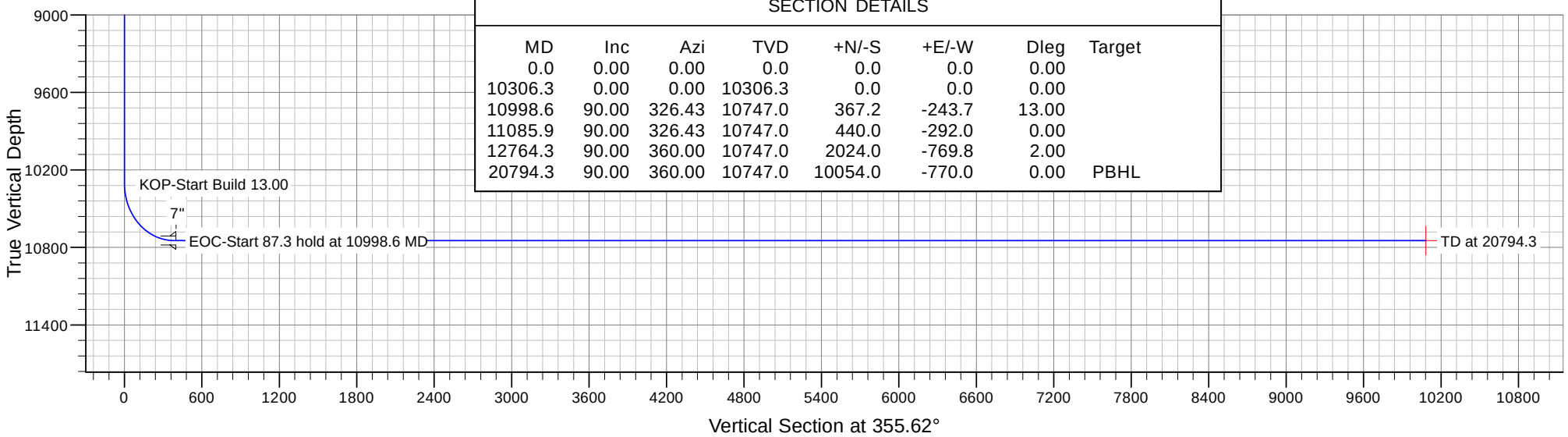


CASING DETAILS

TVD	MD	Name	Size
2070.0	2070.0	9 5/8"	9.625
10747.0	11015.0	7"	7.000

SECTION DETAILS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	
10306.3	0.00	0.00	10306.3	0.0	0.0	0.00	
10998.6	90.00	326.43	10747.0	367.2	-243.7	13.00	
11085.9	90.00	326.43	10747.0	440.0	-292.0	0.00	
12764.3	90.00	360.00	10747.0	2024.0	-769.8	2.00	
20794.3	90.00	360.00	10747.0	10054.0	-770.0	0.00	PBHL



Oasis

Indian Hills
153N-101W-1/12
Timmons 5301 43-12B

OH

Plan: Plan #1

Standard Planning Report

06 January, 2012

Oasis Petroleum

Planning Report

Database:	Compass	**Local Co-ordinate Reference:**	Well Timmons 5301 43-12B
Company:	Oasis	**TVD Reference:**	WELL @ 2118.0ft (Original Well Elev)
Project:	Indian Hills	**MD Reference:**	WELL @ 2118.0ft (Original Well Elev)
Site:	153N-101W-1/12	**North Reference:**	True
Well:	Timmons 5301 43-12B	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1		

Project Indian Hills

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

Site 153N-101W-1/12

Site Position:		**Northing:**	125,065.82 m	**Latitude:**	48° 4' 57.940 N
From:	Lat/Long	**Easting:**	368,244.93 m	**Longitude:**	103° 36' 41.780 W
Position Uncertainty:	0.0 ft	**Slot Radius:**	13.200 in	**Grid Convergence:**	-2.32 °

Well Timmons 5301 43-12B

Well Position	**+N/-S**	13.2 ft	**Northing:**	125,078.23 m	**Latitude:**	48° 4' 58.070 N
	+E/-W	-682.4 ft	**Easting:**	368,037.28 m	**Longitude:**	103° 36' 51.830 W
Position Uncertainty		0.0 ft	**Wellhead Elevation:**		**Ground Level:**	2,093.0 ft

Wellbore OH

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF200510	12/27/2011	8.55	73.09	56,719

Design Plan #1

Audit Notes:

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

Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.0	0.0	0.0	355.62

Plan Sections

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
10,306.3	0.00	0.00	10,306.3	0.0	0.0	0.00	0.00	0.00	0.00	
10,998.6	90.00	326.43	10,747.0	367.2	-243.7	13.00	13.00	0.00	326.43	
11,085.9	90.00	326.43	10,747.0	440.0	-292.0	0.00	0.00	0.00	0.00	
12,764.3	90.00	360.00	10,747.0	2,024.0	-769.8	2.00	0.00	2.00	90.00	
20,794.3	90.00	360.00	10,747.0	10,054.0	-770.0	0.00	0.00	0.00	0.00	Timmons 5301 43-12I

Database:	Compass	**Local Co-ordinate Reference:**	Well Timmons 5301 43-12B
Company:	Oasis	**TVD Reference:**	WELL @ 2118.0ft (Original Well Elev)
Project:	Indian Hills	**MD Reference:**	WELL @ 2118.0ft (Original Well Elev)
Site:	153N-101W-1/12	**North Reference:**	True
Well:	Timmons 5301 43-12B	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	0.00
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	0.00
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	0.00
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	0.00
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	0.00
600.0	0.00	0.00	600.0	0.0	0.0	0.0	0.00	0.00	0.00
700.0	0.00	0.00	700.0	0.0	0.0	0.0	0.00	0.00	0.00
800.0	0.00	0.00	800.0	0.0	0.0	0.0	0.00	0.00	0.00
900.0	0.00	0.00	900.0	0.0	0.0	0.0	0.00	0.00	0.00
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.0	0.00	0.00	0.00
1,100.0	0.00	0.00	1,100.0	0.0	0.0	0.0	0.00	0.00	0.00
1,200.0	0.00	0.00	1,200.0	0.0	0.0	0.0	0.00	0.00	0.00
1,300.0	0.00	0.00	1,300.0	0.0	0.0	0.0	0.00	0.00	0.00
1,400.0	0.00	0.00	1,400.0	0.0	0.0	0.0	0.00	0.00	0.00
1,500.0	0.00	0.00	1,500.0	0.0	0.0	0.0	0.00	0.00	0.00
1,600.0	0.00	0.00	1,600.0	0.0	0.0	0.0	0.00	0.00	0.00
1,700.0	0.00	0.00	1,700.0	0.0	0.0	0.0	0.00	0.00	0.00
1,800.0	0.00	0.00	1,800.0	0.0	0.0	0.0	0.00	0.00	0.00
1,900.0	0.00	0.00	1,900.0	0.0	0.0	0.0	0.00	0.00	0.00
1,968.0	0.00	0.00	1,968.0	0.0	0.0	0.0	0.00	0.00	0.00
Pierre									
2,000.0	0.00	0.00	2,000.0	0.0	0.0	0.0	0.00	0.00	0.00
2,070.0	0.00	0.00	2,070.0	0.0	0.0	0.0	0.00	0.00	0.00
9 5/8"									
2,100.0	0.00	0.00	2,100.0	0.0	0.0	0.0	0.00	0.00	0.00
2,200.0	0.00	0.00	2,200.0	0.0	0.0	0.0	0.00	0.00	0.00
2,300.0	0.00	0.00	2,300.0	0.0	0.0	0.0	0.00	0.00	0.00
2,400.0	0.00	0.00	2,400.0	0.0	0.0	0.0	0.00	0.00	0.00
2,500.0	0.00	0.00	2,500.0	0.0	0.0	0.0	0.00	0.00	0.00
2,600.0	0.00	0.00	2,600.0	0.0	0.0	0.0	0.00	0.00	0.00
2,700.0	0.00	0.00	2,700.0	0.0	0.0	0.0	0.00	0.00	0.00
2,800.0	0.00	0.00	2,800.0	0.0	0.0	0.0	0.00	0.00	0.00
2,900.0	0.00	0.00	2,900.0	0.0	0.0	0.0	0.00	0.00	0.00
3,000.0	0.00	0.00	3,000.0	0.0	0.0	0.0	0.00	0.00	0.00
3,100.0	0.00	0.00	3,100.0	0.0	0.0	0.0	0.00	0.00	0.00
3,200.0	0.00	0.00	3,200.0	0.0	0.0	0.0	0.00	0.00	0.00
3,300.0	0.00	0.00	3,300.0	0.0	0.0	0.0	0.00	0.00	0.00
3,400.0	0.00	0.00	3,400.0	0.0	0.0	0.0	0.00	0.00	0.00
3,500.0	0.00	0.00	3,500.0	0.0	0.0	0.0	0.00	0.00	0.00
3,600.0	0.00	0.00	3,600.0	0.0	0.0	0.0	0.00	0.00	0.00
3,700.0	0.00	0.00	3,700.0	0.0	0.0	0.0	0.00	0.00	0.00
3,800.0	0.00	0.00	3,800.0	0.0	0.0	0.0	0.00	0.00	0.00
3,900.0	0.00	0.00	3,900.0	0.0	0.0	0.0	0.00	0.00	0.00
4,000.0	0.00	0.00	4,000.0	0.0	0.0	0.0	0.00	0.00	0.00
4,100.0	0.00	0.00	4,100.0	0.0	0.0	0.0	0.00	0.00	0.00
4,200.0	0.00	0.00	4,200.0	0.0	0.0	0.0	0.00	0.00	0.00
4,300.0	0.00	0.00	4,300.0	0.0	0.0	0.0	0.00	0.00	0.00
4,400.0	0.00	0.00	4,400.0	0.0	0.0	0.0	0.00	0.00	0.00
4,500.0	0.00	0.00	4,500.0	0.0	0.0	0.0	0.00	0.00	0.00
4,600.0	0.00	0.00	4,600.0	0.0	0.0	0.0	0.00	0.00	0.00
4,634.0	0.00	0.00	4,634.0	0.0	0.0	0.0	0.00	0.00	0.00
Greenhorn									

Database:	Compass	**Local Co-ordinate Reference:**	Well Timmons 5301 43-12B
Company:	Oasis	**TVD Reference:**	WELL @ 2118.0ft (Original Well Elev)
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Site:	153N-101W-1/12	**North Reference:**	True
Well:	Timmons 5301 43-12B	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
4,700.0	0.00	0.00	4,700.0	0.0	0.0	0.0	0.00	0.00	0.00
4,800.0	0.00	0.00	4,800.0	0.0	0.0	0.0	0.00	0.00	0.00
4,900.0	0.00	0.00	4,900.0	0.0	0.0	0.0	0.00	0.00	0.00
5,000.0	0.00	0.00	5,000.0	0.0	0.0	0.0	0.00	0.00	0.00
5,030.0	0.00	0.00	5,030.0	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
5,461.0	0.00	0.00	5,461.0	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
6,377.0	0.00	0.00	6,377.0	0.0	0.0	0.0	0.00	0.00	0.00
Rierdon									
6,400.0	0.00	0.00	6,400.0	0.0	0.0	0.0	0.00	0.00	0.00
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
6,896.0	0.00	0.00	6,896.0	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
6,963.0	0.00	0.00	6,963.0	0.0	0.0	0.0	0.00	0.00	0.00
Dunham Salt Base									
6,968.0	0.00	0.00	6,968.0	0.0	0.0	0.0	0.00	0.00	0.00
Spearfish									
7,000.0	0.00	0.00	7,000.0	0.0	0.0	0.0	0.00	0.00	0.00
7,100.0	0.00	0.00	7,100.0	0.0	0.0	0.0	0.00	0.00	0.00
7,200.0	0.00	0.00	7,200.0	0.0	0.0	0.0	0.00	0.00	0.00
7,212.0	0.00	0.00	7,212.0	0.0	0.0	0.0	0.00	0.00	0.00
Pine Salt									
7,300.0	0.00	0.00	7,300.0	0.0	0.0	0.0	0.00	0.00	0.00
7,337.0	0.00	0.00	7,337.0	0.0	0.0	0.0	0.00	0.00	0.00
Pine Salt Base									
7,365.0	0.00	0.00	7,365.0	0.0	0.0	0.0	0.00	0.00	0.00
Opeche Salt									
7,400.0	0.00	0.00	7,400.0	0.0	0.0	0.0	0.00	0.00	0.00
7,444.0	0.00	0.00	7,444.0	0.0	0.0	0.0	0.00	0.00	0.00
Opeche Salt Base									
7,500.0	0.00	0.00	7,500.0	0.0	0.0	0.0	0.00	0.00	0.00
7,600.0	0.00	0.00	7,600.0	0.0	0.0	0.0	0.00	0.00	0.00
7,625.0	0.00	0.00	7,625.0	0.0	0.0	0.0	0.00	0.00	0.00
Broom Creek (Top of Minnelusa Gp.)									
7,668.0	0.00	0.00	7,668.0	0.0	0.0	0.0	0.00	0.00	0.00

Database:	Compass	**Local Co-ordinate Reference:**	Well Timmons 5301 43-12B
Company:	Oasis	**TVD Reference:**	WELL @ 2118.0ft (Original Well Elev)
Project:	Indian Hills	**MD Reference:**	WELL @ 2118.0ft (Original Well Elev)
Site:	153N-101W-1/12	**North Reference:**	True
Well:	Timmons 5301 43-12B	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
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
7,844.0	0.00	0.00	7,844.0	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
8,031.0	0.00	0.00	8,031.0	0.0	0.0	0.0	0.00	0.00	0.00
Otter (Base of Minnelusa Gp.)									
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
8,365.0	0.00	0.00	8,365.0	0.0	0.0	0.0	0.00	0.00	0.00
Kibbey									
8,400.0	0.00	0.00	8,400.0	0.0	0.0	0.0	0.00	0.00	0.00
8,500.0	0.00	0.00	8,500.0	0.0	0.0	0.0	0.00	0.00	0.00
8,512.0	0.00	0.00	8,512.0	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
9,135.0	0.00	0.00	9,135.0	0.0	0.0	0.0	0.00	0.00	0.00
UB									
9,200.0	0.00	0.00	9,200.0	0.0	0.0	0.0	0.00	0.00	0.00
9,212.0	0.00	0.00	9,212.0	0.0	0.0	0.0	0.00	0.00	0.00
Base Last Salt									
9,260.0	0.00	0.00	9,260.0	0.0	0.0	0.0	0.00	0.00	0.00
Ratcliffe									
9,300.0	0.00	0.00	9,300.0	0.0	0.0	0.0	0.00	0.00	0.00
9,400.0	0.00	0.00	9,400.0	0.0	0.0	0.0	0.00	0.00	0.00
9,436.0	0.00	0.00	9,436.0	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
10,000.0	0.00	0.00	10,000.0	0.0	0.0	0.0	0.00	0.00	0.00
10,010.0	0.00	0.00	10,010.0	0.0	0.0	0.0	0.00	0.00	0.00
Lodgepole									
10,100.0	0.00	0.00	10,100.0	0.0	0.0	0.0	0.00	0.00	0.00
10,160.0	0.00	0.00	10,160.0	0.0	0.0	0.0	0.00	0.00	0.00
Lodgepole Fracture Zone									
10,200.0	0.00	0.00	10,200.0	0.0	0.0	0.0	0.00	0.00	0.00
10,306.3	0.00	0.00	10,306.3	0.0	0.0	0.0	0.00	0.00	0.00
KOP-Start Build 13.00									
10,325.0	2.44	326.43	10,325.0	0.3	-0.2	0.3	13.00	13.00	0.00
10,350.0	5.69	326.43	10,349.9	1.8	-1.2	1.9	13.00	13.00	0.00
10,375.0	8.94	326.43	10,374.7	4.5	-3.0	4.7	13.00	13.00	0.00

Database:	Compass	**Local Co-ordinate Reference:**	Well Timmons 5301 43-12B
Company:	Oasis	**TVD Reference:**	WELL @ 2118.0ft (Original Well Elev)
Project:	Indian Hills	**MD Reference:**	WELL @ 2118.0ft (Original Well Elev)
Site:	153N-101W-1/12	**North Reference:**	True
Well:	Timmons 5301 43-12B	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
10,400.0	12.19	326.43	10,399.3	8.3	-5.5	8.7	13.00	13.00	0.00
10,425.0	15.44	326.43	10,423.6	13.2	-8.8	13.9	13.00	13.00	0.00
10,450.0	18.69	326.43	10,447.5	19.4	-12.8	20.3	13.00	13.00	0.00
10,475.0	21.94	326.43	10,470.9	26.6	-17.6	27.9	13.00	13.00	0.00
10,500.0	25.19	326.43	10,493.8	34.9	-23.2	36.6	13.00	13.00	0.00
10,525.0	28.44	326.43	10,516.1	44.3	-29.4	46.4	13.00	13.00	0.00
10,550.0	31.69	326.43	10,537.8	54.7	-36.3	57.4	13.00	13.00	0.00
10,575.0	34.94	326.43	10,558.7	66.2	-43.9	69.3	13.00	13.00	0.00
10,600.0	38.19	326.43	10,578.7	78.6	-52.2	82.3	13.00	13.00	0.00
10,625.0	41.44	326.43	10,597.9	91.9	-61.0	96.3	13.00	13.00	0.00
10,650.0	44.69	326.43	10,616.2	106.1	-70.4	111.2	13.00	13.00	0.00
10,675.0	47.94	326.43	10,633.5	121.2	-80.4	127.0	13.00	13.00	0.00
10,700.0	51.19	326.43	10,649.7	137.1	-91.0	143.6	13.00	13.00	0.00
10,725.0	54.44	326.43	10,664.8	153.6	-102.0	161.0	13.00	13.00	0.00
10,750.0	57.69	326.43	10,678.7	170.9	-113.4	179.1	13.00	13.00	0.00
10,775.0	60.94	326.43	10,691.5	188.8	-125.3	197.9	13.00	13.00	0.00
10,800.0	64.19	326.43	10,703.0	207.3	-137.6	217.2	13.00	13.00	0.00
10,825.0	67.44	326.43	10,713.3	226.3	-150.2	237.1	13.00	13.00	0.00
10,832.3	68.38	326.43	10,716.0	231.9	-153.9	243.0	13.00	13.00	0.00
False Bakken									
10,850.0	70.69	326.43	10,722.2	245.8	-163.1	257.5	13.00	13.00	0.00
10,858.7	71.82	326.43	10,725.0	252.7	-167.7	264.7	13.00	13.00	0.00
Upper Bakken									
10,875.0	73.94	326.43	10,729.8	265.6	-176.3	278.3	13.00	13.00	0.00
10,900.0	77.19	326.43	10,736.0	285.8	-189.7	299.4	13.00	13.00	0.00
10,919.9	79.77	326.43	10,740.0	302.0	-200.4	316.5	13.00	13.00	0.00
Middle Bakken									
10,925.0	80.44	326.43	10,740.9	306.2	-203.2	320.8	13.00	13.00	0.00
10,950.0	83.69	326.43	10,744.3	326.8	-216.9	342.4	13.00	13.00	0.00
10,975.0	86.94	326.43	10,746.4	347.6	-230.7	364.2	13.00	13.00	0.00
10,998.5	90.00	326.43	10,747.0	367.2	-243.7	384.7	13.00	13.00	0.00
EOC-Start 87.3 hold at 10998.6 MD - Middle Bakken Sand Target									
11,000.0	90.00	326.43	10,747.0	368.4	-244.5	386.0	0.26	0.26	0.00
11,015.0	90.00	326.43	10,747.0	380.9	-252.8	399.1	0.00	0.00	0.00
7"									
11,085.9	90.00	326.43	10,747.0	440.0	-292.0	461.0	0.00	0.00	0.00
Start DLS 2.00 TFO 90.00									
11,100.0	90.00	326.71	10,747.0	451.8	-299.8	473.3	2.00	0.00	2.00
11,200.0	90.00	328.71	10,747.0	536.3	-353.2	561.7	2.00	0.00	2.00
11,300.0	90.00	330.71	10,747.0	622.6	-403.6	651.6	2.00	0.00	2.00
11,400.0	90.00	332.71	10,747.0	710.7	-451.0	743.1	2.00	0.00	2.00
11,500.0	90.00	334.71	10,747.0	800.3	-495.3	835.8	2.00	0.00	2.00
11,600.0	90.00	336.71	10,747.0	891.5	-536.4	929.8	2.00	0.00	2.00
11,700.0	90.00	338.71	10,747.0	984.0	-574.3	1,025.0	2.00	0.00	2.00
11,800.0	90.00	340.71	10,747.0	1,077.8	-609.0	1,121.2	2.00	0.00	2.00
11,900.0	90.00	342.71	10,747.0	1,172.7	-640.4	1,218.2	2.00	0.00	2.00
12,000.0	90.00	344.71	10,747.0	1,268.7	-668.4	1,316.1	2.00	0.00	2.00
12,100.0	90.00	346.71	10,747.0	1,365.6	-693.1	1,414.6	2.00	0.00	2.00
12,200.0	90.00	348.71	10,747.0	1,463.3	-714.4	1,513.6	2.00	0.00	2.00
12,300.0	90.00	350.71	10,747.0	1,561.7	-732.2	1,613.1	2.00	0.00	2.00
12,400.0	90.00	352.71	10,747.0	1,660.7	-746.7	1,712.8	2.00	0.00	2.00
12,500.0	90.00	354.71	10,747.0	1,760.1	-757.6	1,812.8	2.00	0.00	2.00
12,600.0	90.00	356.71	10,747.0	1,859.8	-765.1	1,912.8	2.00	0.00	2.00

Database:	Compass	**Local Co-ordinate Reference:**	Well Timmons 5301 43-12B
Company:	Oasis	**TVD Reference:**	WELL @ 2118.0ft (Original Well Elev)
Project:	Indian Hills	**MD Reference:**	WELL @ 2118.0ft (Original Well Elev)
Site:	153N-101W-1/12	**North Reference:**	True
Well:	Timmons 5301 43-12B	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
12,700.0	90.00	358.71	10,747.0	1,959.7	-769.1	2,012.7	2.00	0.00	2.00
12,764.3	90.00	360.00	10,747.0	2,024.0	-769.8	2,076.9	2.00	0.00	2.00
Start 8030.0 hold at 12764.3 MD									
12,800.0	90.00	360.00	10,747.0	2,059.7	-769.8	2,112.5	0.00	0.00	0.00
12,900.0	90.00	360.00	10,747.0	2,159.7	-769.8	2,212.2	0.00	0.00	0.00
13,000.0	90.00	360.00	10,747.0	2,259.7	-769.8	2,311.9	0.00	0.00	0.00
13,100.0	90.00	360.00	10,747.0	2,359.7	-769.8	2,411.6	0.00	0.00	0.00
13,200.0	90.00	360.00	10,747.0	2,459.7	-769.8	2,511.3	0.00	0.00	0.00
13,300.0	90.00	360.00	10,747.0	2,559.7	-769.8	2,611.0	0.00	0.00	0.00
13,400.0	90.00	360.00	10,747.0	2,659.7	-769.8	2,710.7	0.00	0.00	0.00
13,500.0	90.00	360.00	10,747.0	2,759.7	-769.8	2,810.4	0.00	0.00	0.00
13,600.0	90.00	360.00	10,747.0	2,859.7	-769.8	2,910.1	0.00	0.00	0.00
13,700.0	90.00	360.00	10,747.0	2,959.7	-769.8	3,009.8	0.00	0.00	0.00
13,800.0	90.00	360.00	10,747.0	3,059.7	-769.8	3,109.5	0.00	0.00	0.00
13,900.0	90.00	360.00	10,747.0	3,159.7	-769.8	3,209.3	0.00	0.00	0.00
14,000.0	90.00	360.00	10,747.0	3,259.7	-769.8	3,309.0	0.00	0.00	0.00
14,100.0	90.00	360.00	10,747.0	3,359.7	-769.8	3,408.7	0.00	0.00	0.00
14,200.0	90.00	360.00	10,747.0	3,459.7	-769.8	3,508.4	0.00	0.00	0.00
14,300.0	90.00	360.00	10,747.0	3,559.7	-769.8	3,608.1	0.00	0.00	0.00
14,400.0	90.00	360.00	10,747.0	3,659.7	-769.8	3,707.8	0.00	0.00	0.00
14,500.0	90.00	360.00	10,747.0	3,759.7	-769.8	3,807.5	0.00	0.00	0.00
14,600.0	90.00	360.00	10,747.0	3,859.7	-769.9	3,907.2	0.00	0.00	0.00
14,700.0	90.00	360.00	10,747.0	3,959.7	-769.9	4,006.9	0.00	0.00	0.00
14,800.0	90.00	360.00	10,747.0	4,059.7	-769.9	4,106.6	0.00	0.00	0.00
14,900.0	90.00	360.00	10,747.0	4,159.7	-769.9	4,206.3	0.00	0.00	0.00
15,000.0	90.00	360.00	10,747.0	4,259.7	-769.9	4,306.0	0.00	0.00	0.00
15,100.0	90.00	360.00	10,747.0	4,359.7	-769.9	4,405.8	0.00	0.00	0.00
15,200.0	90.00	360.00	10,747.0	4,459.7	-769.9	4,505.5	0.00	0.00	0.00
15,300.0	90.00	360.00	10,747.0	4,559.7	-769.9	4,605.2	0.00	0.00	0.00
15,400.0	90.00	360.00	10,747.0	4,659.7	-769.9	4,704.9	0.00	0.00	0.00
15,500.0	90.00	360.00	10,747.0	4,759.7	-769.9	4,804.6	0.00	0.00	0.00
15,600.0	90.00	360.00	10,747.0	4,859.7	-769.9	4,904.3	0.00	0.00	0.00
15,700.0	90.00	360.00	10,747.0	4,959.7	-769.9	5,004.0	0.00	0.00	0.00
15,800.0	90.00	360.00	10,747.0	5,059.7	-769.9	5,103.7	0.00	0.00	0.00
15,900.0	90.00	360.00	10,747.0	5,159.7	-769.9	5,203.4	0.00	0.00	0.00
16,000.0	90.00	360.00	10,747.0	5,259.7	-769.9	5,303.1	0.00	0.00	0.00
16,100.0	90.00	360.00	10,747.0	5,359.7	-769.9	5,402.8	0.00	0.00	0.00
16,200.0	90.00	360.00	10,747.0	5,459.7	-769.9	5,502.5	0.00	0.00	0.00
16,300.0	90.00	360.00	10,747.0	5,559.7	-769.9	5,602.3	0.00	0.00	0.00
16,400.0	90.00	360.00	10,747.0	5,659.7	-769.9	5,702.0	0.00	0.00	0.00
16,500.0	90.00	360.00	10,747.0	5,759.7	-769.9	5,801.7	0.00	0.00	0.00
16,600.0	90.00	360.00	10,747.0	5,859.7	-769.9	5,901.4	0.00	0.00	0.00
16,700.0	90.00	360.00	10,747.0	5,959.7	-769.9	6,001.1	0.00	0.00	0.00
16,800.0	90.00	360.00	10,747.0	6,059.7	-769.9	6,100.8	0.00	0.00	0.00
16,900.0	90.00	360.00	10,747.0	6,159.7	-769.9	6,200.5	0.00	0.00	0.00
17,000.0	90.00	360.00	10,747.0	6,259.7	-769.9	6,300.2	0.00	0.00	0.00
17,100.0	90.00	360.00	10,747.0	6,359.7	-769.9	6,399.9	0.00	0.00	0.00
17,200.0	90.00	360.00	10,747.0	6,459.7	-769.9	6,499.6	0.00	0.00	0.00
17,300.0	90.00	360.00	10,747.0	6,559.7	-769.9	6,599.3	0.00	0.00	0.00
17,400.0	90.00	360.00	10,747.0	6,659.7	-769.9	6,699.0	0.00	0.00	0.00
17,500.0	90.00	360.00	10,747.0	6,759.7	-769.9	6,798.7	0.00	0.00	0.00
17,600.0	90.00	360.00	10,747.0	6,859.7	-769.9	6,898.5	0.00	0.00	0.00
17,700.0	90.00	360.00	10,747.0	6,959.7	-769.9	6,998.2	0.00	0.00	0.00

Database:	Compass	**Local Co-ordinate Reference:**	Well Timmons 5301 43-12B
Company:	Oasis	**TVD Reference:**	WELL @ 2118.0ft (Original Well Elev)
Project:	Indian Hills	**MD Reference:**	WELL @ 2118.0ft (Original Well Elev)
Site:	153N-101W-1/12	**North Reference:**	True
Well:	Timmons 5301 43-12B	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
17,800.0	90.00	360.00	10,747.0	7,059.7	-769.9	7,097.9	0.00	0.00	0.00
17,900.0	90.00	360.00	10,747.0	7,159.7	-769.9	7,197.6	0.00	0.00	0.00
18,000.0	90.00	360.00	10,747.0	7,259.7	-769.9	7,297.3	0.00	0.00	0.00
18,100.0	90.00	360.00	10,747.0	7,359.7	-769.9	7,397.0	0.00	0.00	0.00
18,200.0	90.00	360.00	10,747.0	7,459.7	-769.9	7,496.7	0.00	0.00	0.00
18,300.0	90.00	360.00	10,747.0	7,559.7	-769.9	7,596.4	0.00	0.00	0.00
18,400.0	90.00	360.00	10,747.0	7,659.7	-769.9	7,696.1	0.00	0.00	0.00
18,500.0	90.00	360.00	10,747.0	7,759.7	-769.9	7,795.8	0.00	0.00	0.00
18,600.0	90.00	360.00	10,747.0	7,859.7	-769.9	7,895.5	0.00	0.00	0.00
18,700.0	90.00	360.00	10,747.0	7,959.7	-769.9	7,995.2	0.00	0.00	0.00
18,800.0	90.00	360.00	10,747.0	8,059.7	-770.0	8,095.0	0.00	0.00	0.00
18,900.0	90.00	360.00	10,747.0	8,159.7	-770.0	8,194.7	0.00	0.00	0.00
19,000.0	90.00	360.00	10,747.0	8,259.7	-770.0	8,294.4	0.00	0.00	0.00
19,100.0	90.00	360.00	10,747.0	8,359.7	-770.0	8,394.1	0.00	0.00	0.00
19,200.0	90.00	360.00	10,747.0	8,459.7	-770.0	8,493.8	0.00	0.00	0.00
19,300.0	90.00	360.00	10,747.0	8,559.7	-770.0	8,593.5	0.00	0.00	0.00
19,400.0	90.00	360.00	10,747.0	8,659.7	-770.0	8,693.2	0.00	0.00	0.00
19,500.0	90.00	360.00	10,747.0	8,759.7	-770.0	8,792.9	0.00	0.00	0.00
19,600.0	90.00	360.00	10,747.0	8,859.7	-770.0	8,892.6	0.00	0.00	0.00
19,700.0	90.00	360.00	10,747.0	8,959.7	-770.0	8,992.3	0.00	0.00	0.00
19,800.0	90.00	360.00	10,747.0	9,059.7	-770.0	9,092.0	0.00	0.00	0.00
19,900.0	90.00	360.00	10,747.0	9,159.7	-770.0	9,191.7	0.00	0.00	0.00
20,000.0	90.00	360.00	10,747.0	9,259.7	-770.0	9,291.5	0.00	0.00	0.00
20,100.0	90.00	360.00	10,747.0	9,359.7	-770.0	9,391.2	0.00	0.00	0.00
20,200.0	90.00	360.00	10,747.0	9,459.7	-770.0	9,490.9	0.00	0.00	0.00
20,300.0	90.00	360.00	10,747.0	9,559.7	-770.0	9,590.6	0.00	0.00	0.00
20,400.0	90.00	360.00	10,747.0	9,659.7	-770.0	9,690.3	0.00	0.00	0.00
20,500.0	90.00	360.00	10,747.0	9,759.7	-770.0	9,790.0	0.00	0.00	0.00
20,600.0	90.00	360.00	10,747.0	9,859.7	-770.0	9,889.7	0.00	0.00	0.00
20,700.0	90.00	360.00	10,747.0	9,959.7	-770.0	9,989.4	0.00	0.00	0.00
20,794.3	90.00	360.00	10,747.0	10,054.0	-770.0	10,083.4	0.00	0.00	0.00
TD at 20794.3									

Design Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (m)	Easting (m)	Latitude	Longitude
Timmons 5301 43-12B F - plan hits target center - Point	0.00	0.00	10,747.0	10,054.0	-770.0	128,149.68	367,926.70	48° 6' 37.292 N	103° 37' 3.177 W

Casing Points

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (in)	Hole Diameter (in)
2,070.0	2,070.0	9 5/8"	9.625	13.500
11,015.0	10,747.0	7"	7.000	8.750

Database:	Compass	**Local Co-ordinate Reference:**	Well Timmons 5301 43-12B
Company:	Oasis	**TVD Reference:**	WELL @ 2118.0ft (Original Well Elev)
Project:	Indian Hills	**MD Reference:**	WELL @ 2118.0ft (Original Well Elev)
Site:	153N-101W-1/12	**North Reference:**	True
Well:	Timmons 5301 43-12B	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1		

Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
1,968.0	1,968.0	Pierre			
4,634.0	4,634.0	Greenhorn			
5,030.0	5,030.0	Mowry			
5,461.0	5,461.0	Dakota			
6,377.0	6,377.0	Rierdon			
6,896.0	6,896.0	Dunham Salt			
6,963.0	6,963.0	Dunham Salt Base			
6,968.0	6,968.0	Spearfish			
7,212.0	7,212.0	Pine Salt			
7,337.0	7,337.0	Pine Salt Base			
7,365.0	7,365.0	Opeche Salt			
7,444.0	7,444.0	Opeche Salt Base			
7,625.0	7,625.0	Broom Creek (Top of Minnelusa Gp.)			
7,668.0	7,668.0	Amsden			
7,844.0	7,844.0	Tyler			
8,031.0	8,031.0	Otter (Base of Minnelusa Gp.)			
8,365.0	8,365.0	Kibbey			
8,512.0	8,512.0	Charles Salt			
9,135.0	9,135.0	UB			
9,212.0	9,212.0	Base Last Salt			
9,260.0	9,260.0	Ratcliffe			
9,436.0	9,436.0	Mission Canyon			
10,010.0	10,010.0	Lodgepole			
10,160.0	10,160.0	Lodgepole Fracture Zone			
10,832.3	10,716.0	False Bakken			
10,858.7	10,725.0	Upper Bakken			
10,919.9	10,740.0	Middle Bakken			
10,998.5	10,747.0	Middle Bakken Sand Target			

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates +N/-S (ft)	Local Coordinates +E/-W (ft)	Comment
10,306.3	10,306.3	0.0	0.0	KOP-Start Build 13.00
10,998.6	10,747.0	367.2	-243.7	EOC-Start 87.3 hold at 10998.6 MD
11,085.9	10,747.0	440.0	-292.0	Start DLS 2.00 TFO 90.00
12,764.3	10,747.0	2,024.0	-769.8	Start 8030.0 hold at 12764.3 MD
20,794.3	10,747.0	10,054.0	-770.0	TD at 20794.3

SECTION BREAKDOWN

OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 1500 HOUSTON, TX 77002
"TIMMONS 5301 43-12B"
250 FEET FROM SOUTH LINE AND 2510 FEET FROM EAST LINE
SECTIONS 1 & 12, T153N, R101W, 5TH P.M., MCKENZIE COUNTY, NORTH DAKOTA

VICINITY MAP

ALL BEARINGS ARE BASED ON G.P.S. DERIVED BEARINGS. THE ORIGINAL SURVEY OF THIS AREA FOR THE GENERAL LAND OFFICE (G.L.O.) WAS 1900. THE CORNERS FOUND ARE AS INDICATED AND ALL OTHERS ARE COMPUTED FROM THOSE CORNERS FOUND AND BASED ON G.L.O. DATA.

NORTH DAKOTA
C.S.
1222
12/7/11
REGISTERED
LAND SURVEYOR

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2/8
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OASIS PETROLEUM NORTH AMERICA, LLC
SECTION BREAKDOWN
SECTIONS 1 & 12, T153N, R101W

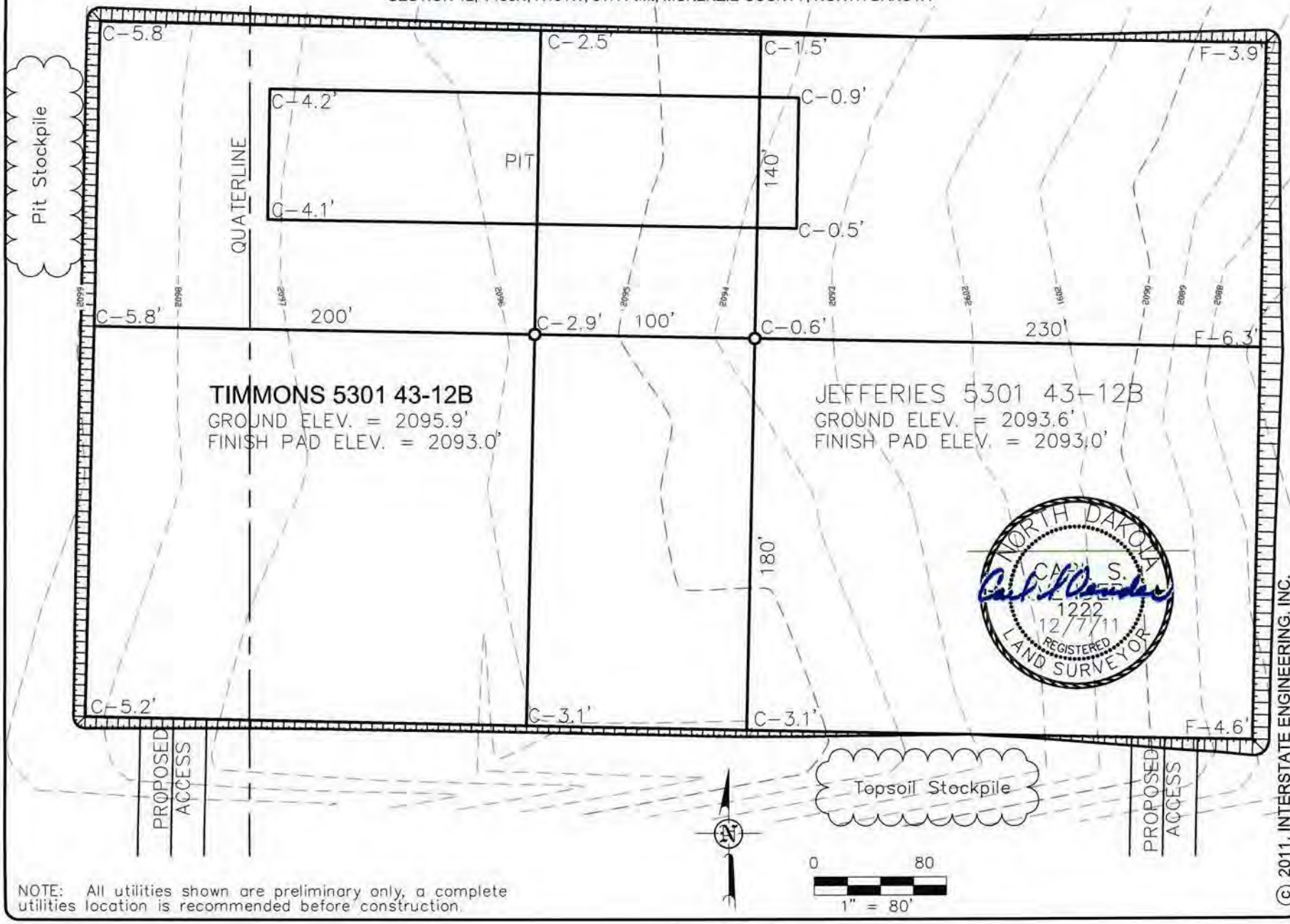
MCKENZIE COUNTY, NORTH DAKOTA

Drawn By:	J.J.S.	Project No.:	S11-09-381
Checked By:	C.S.V.	Date:	DEC 2011

Revision No.	Date	By	Description

PAD LAYOUT

OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 1500 HOUSTON, TX 77002
"TIMMONS 5301 43-12B"
250 FEET FROM SOUTH LINE AND 2510 FEET FROM EAST LINE
SECTION 12, T153N, R101W, 5TH P.M., MCKENZIE COUNTY, NORTH DAKOTA



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

Revision No.	Date	By	Description

OASIS PETROLEUM NORTH AMERICA, LLC
PAD LAYOUT
SECTION 12, T153N, R101W
MCKENZIE COUNTY, NORTH DAKOTA

Drawn By: J.T.S. Project No.: S11-9-361
Checked By: C.S.V. Date: DEC 2011

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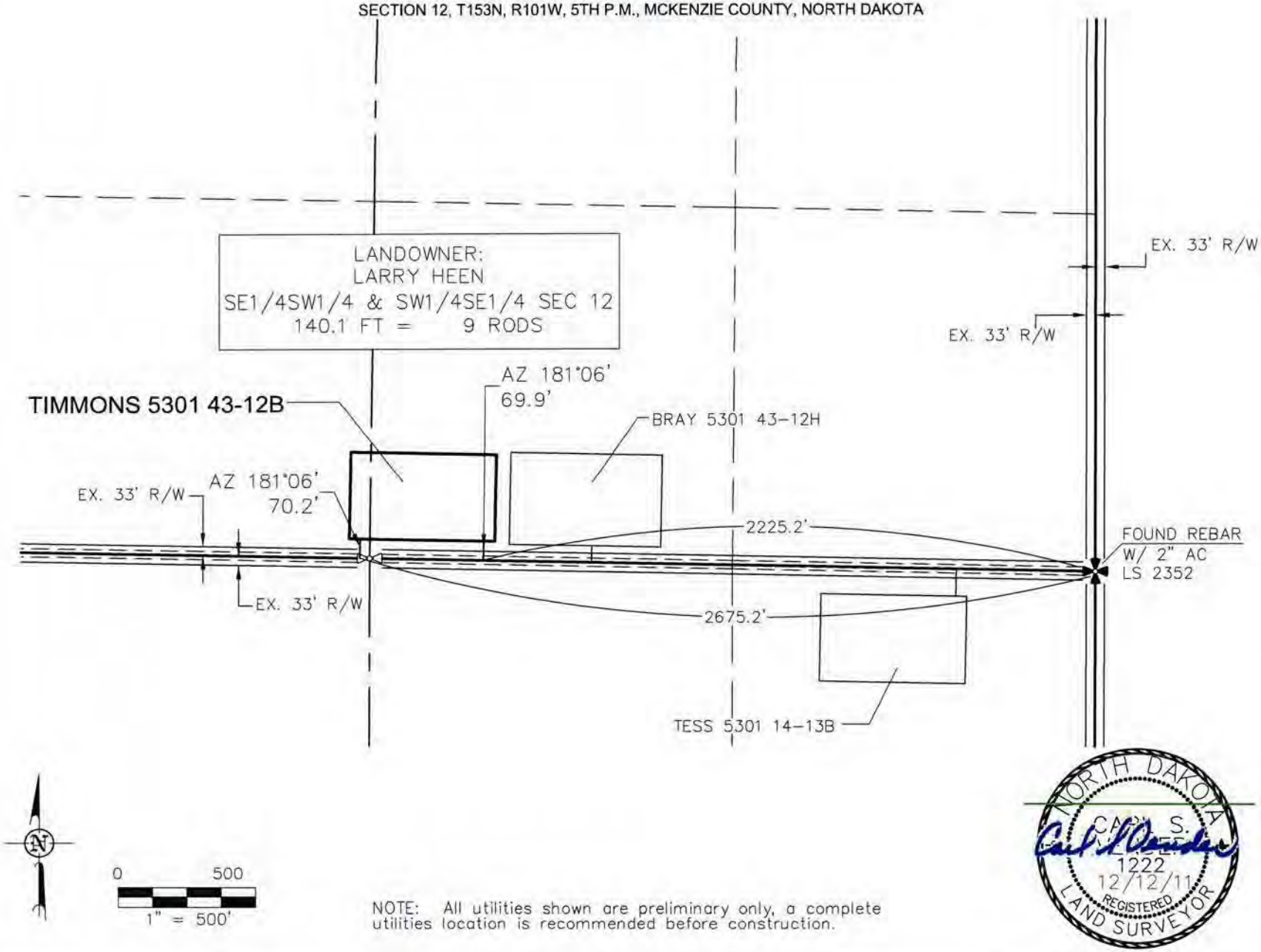
ACCESS APPROACH

OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 1500 HOUSTON, TX 77002
"TIMMONS 5301 43-12B"
250 FEET FROM SOUTH LINE AND 2510 FEET FROM EAST LINE
SECTION 12, T153N, R101W, 5TH P.M., MCKENZIE COUNTY, NORTH DAKOTA



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

NORTH DAKOTA
CARL S. ANDERSON
1222
12/12/11
REGISTERED
LAND SURVEYOR

Revision No.	Date	By	Description

OASIS PETROLEUM NORTH AMERICA, LLC
ACCESS APPROACH
SECTION 12, T153N, R101W
MCKENZIE COUNTY, NORTH DAKOTA

Drawn By: J.J.S. Project No.: S11-09-361
Checked By: C.S.V. Date: DEC 2011

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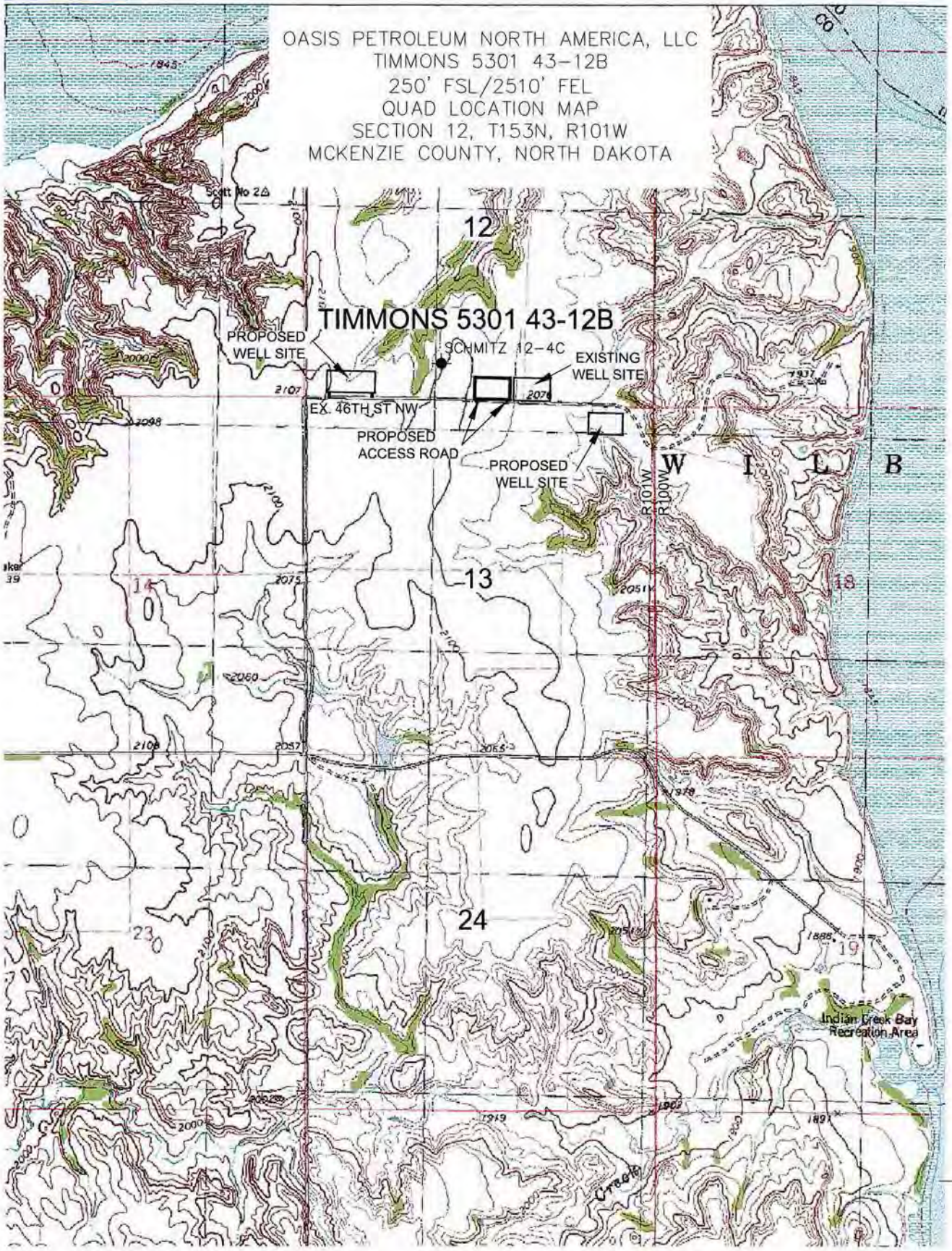

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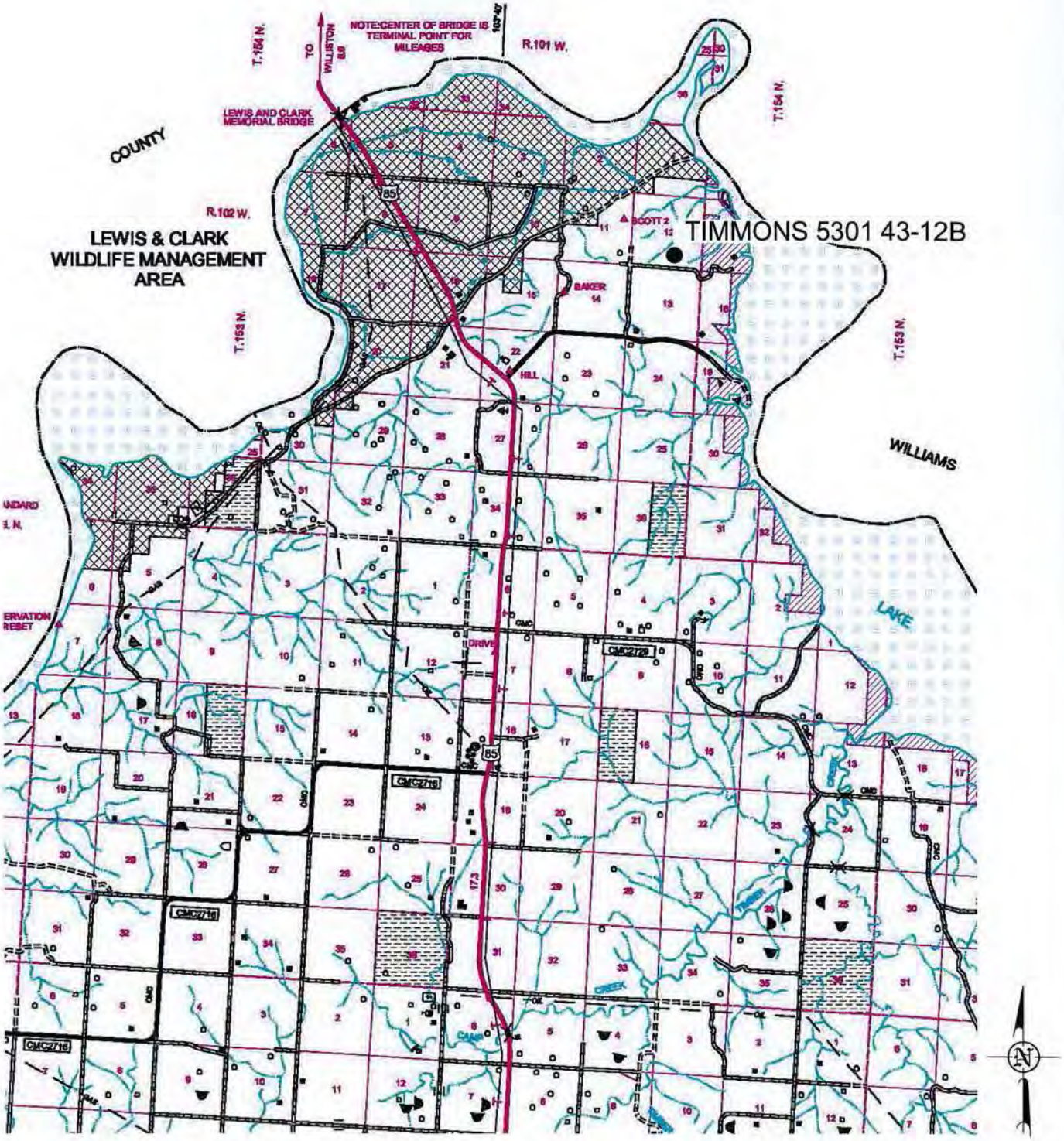
OASIS PETROLEUM NORTH AMERICA, LLC
QUAD LOCATION MAP
SECTION 12, T153N, R101W
MCKENZIE COUNTY, NORTH DAKOTA

Drawn By:	J.J.S.	Project No.:	S11-09-361
Checked By:	C.S.V.	Date:	DEC 2011

Revision No.	Date	By	Description

COUNTY ROAD MAP

OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 1500 HOUSTON, TX 77002
"TIMMONS 5301 43-12B"
250 FEET FROM SOUTH LINE AND 2510 FEET FROM EAST LINE
SECTION 12, T153N, R101W, 5TH P.M., MCKENZIE COUNTY, NORTH DAKOTA



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SCALE: 1" = 2 MILE

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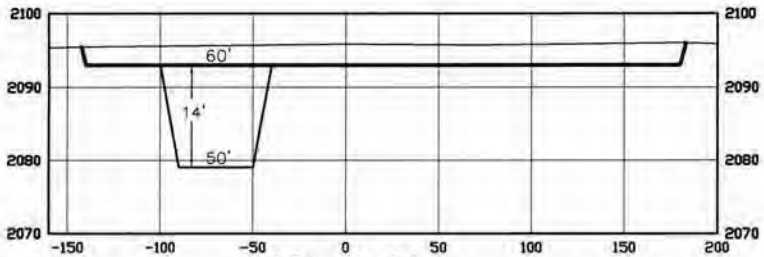
OASIS PETROLEUM NORTH AMERICA, LLC
COUNTY ROAD MAP
SECTION 12, T153N, R101W
MCKENZIE COUNTY, NORTH DAKOTA

Drawn By: J.J.S. | Project No.: S11-09-361
Checked By: C.S.V. | Date: DEC 2011

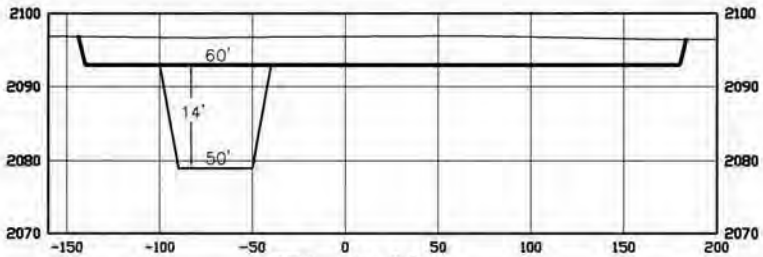
Revision No.	Date	By	Description

CROSS SECTIONS

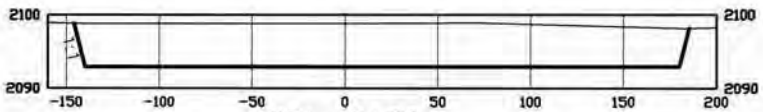
OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 1500 HOUSTON, TX 77002
"TIMMONS 5301 43-12B"
250 FEET FROM SOUTH LINE AND 2510 FEET FROM EAST LINE
SECTION 12, T153N, R101W, 5TH P.M., MCKENZIE COUNTY, NORTH DAKOTA



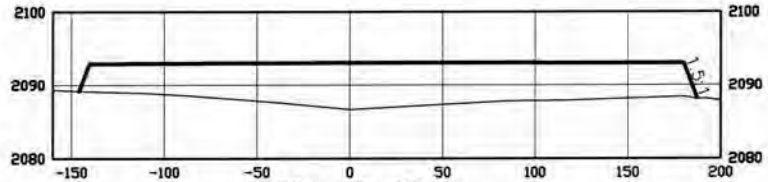
STA. 2+00



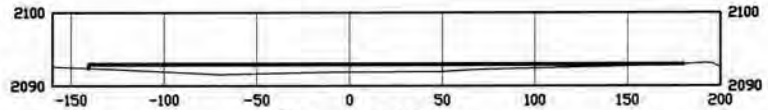
STA. 1+00



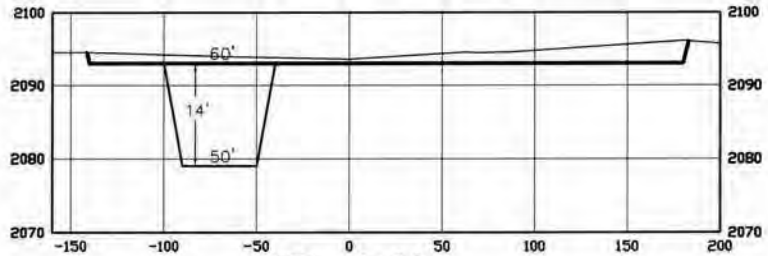
STA. 0+00



STA. 5+30



STA. 4+00



STA. 3+00

SCALE
HORIZ 1'=100'
VERT 1'=20'

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Revision No.	Date	By	Description

OASIS PETROLEUM NORTH AMERICA, LLC
PAD CROSS SECTIONS
SECTION 12, T153N, R101W
MCKENZIE COUNTY, NORTH DAKOTA

Drawn By: J.J.S. Project No.: S11-9-361
Checked By: C.S.V. Date: DEC 2011

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SHEET NO. 7/8

WELL LOCATION SITE QUANTITIES

OASIS PETROLEUM NORTH AMERICA, LLC
1001 FANNIN, SUITE 1500 HOUSTON, TX 77002
"TIMMONS 5301 43-12B"
250 FEET FROM SOUTH LINE AND 2510 FEET FROM EAST LINE
SECTION 12, T153N, R101W, 5TH P.M., MCKENZIE COUNTY, NORTH DAKOTA

WELL SITE ELEVATION	2095.9
WELL PAD ELEVATION	2093.0

EXCAVATION	12,909
PLUS PIT	3,150
	16,059
EMBANKMENT	4,705
PLUS SHRINKAGE (30%)	1,412
	6,117
STOCKPILE PIT	3,150
STOCKPILE TOP SOIL (6")	3,284
STOCKPILE FROM PAD	3,508
DISTURBED AREA FROM PAD	4.07 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
2510' FEL
250' FSL

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OASIS PETROLEUM NORTH AMERICA, LLC
QUANTITIES
SECTION 12, T153N, R101W
MCKENZIE COUNTY, NORTH DAKOTA

Drawn By: J.J.S. Project No.: S11-09-361
Checked By: C.S.V. Date: DEC 2011

Revision No.	Date	By	Description

SURFACE DAMAGE SETTLEMENT AND RELEASE

In consideration for the sum of _____ Dollars ($ _____) paid by Oasis Petroleum North America LLC ("Oasis") to the undersigned surface owners, Larry P. Heen, a married man dealing in his sole & separate property ("Owners," and together with Oasis, the "Parties") for themselves and their heirs, successors, administrators and assigns, hereby acknowledge the receipt and sufficiency of said payment as a full and complete settlement for and as a release of all claims for loss, damage or injury to the Subject Lands (as defined herein) arising out of the Operations (as defined herein) of the Jefferies 5301 43-12B & Timmons 5301 43-12B the "Well(s)" located on the approximately (6) six acre tract of land identified on the plat attached hereto as Exhibit "A" (the "Subject Lands") and which is situated on the following described real property located in McKenzie County, State of North Dakota, to wit:

Township 153 North, Range 101 West, 5th P.M.
Section 12: SE4SW4, SW4SE4

This pad shall accommodate the drilling of the Jefferies 5301 43-12B well and the Timmons 5301 43-12B well on the same location. The undersigned is fully aware that the cuttings generated from the drilling of the above described wells will be buried on site on the above described location.

The Parties agree that the settlement and release described herein does not include any claims by any third party against the Owners for personal injury or property damage arising directly out of Oasis's Operations, and Oasis agrees to indemnify, defend and hold harmless Owners against all liabilities arising from such claim (except as such claim arises from the gross negligence or willful misconduct of the Owners).

In further consideration of the payments specified herein, Oasis is hereby specifically granted the right to construct, install and operate, replace or remove pads, pits, pumps, compressors, tanks, roads, pipelines, equipment or other facilities on the above described tract of land necessary for its drilling, completion, operation and/or plugging and abandonment of the Well(s) (the "Operations"), and to the extent such facilities are maintained by Oasis for use on the Subject Lands, this agreement shall permit Oasis's use of such facilities for the Operations on the Subject Lands.

Should commercial production be established from the Well(s), Oasis agrees to pay Owners an annual amount of $ _____ per year beginning one year after the completion of the Wells and to be paid annually until the Wells is plugged and abandoned.

The Parties expressly agree and acknowledge that the payments described herein to be made by Oasis to the Owners constitute full satisfaction of the requirements of Chapter 38.11.1 of the North Dakota Century Code and, once in effect, the amended Chapter 38.11.1 of the North Dakota Century Code enacted by House Bill 1241. The Parties further expressly agree and acknowledge that the $ payment set forth above constitutes full and adequate consideration for damage and disruption required under Section 38.11.1-04 of the North Dakota Century Code, and that the $ _____ payment set forth above constitutes full and adequate consideration for loss of production payments under Section 38.11.1-08.1 of the North Dakota Century Code.

Oasis shall keep the Site free of noxious weeds, and shall take reasonable steps to control erosion and washouts on the Site. Oasis shall restore the Site to a condition as near to the original condition of the Site as is reasonably possible, including the re-contouring, replacing of topsoil and re-seeding of the Site (such actions, the "Restoration").

The surface owners grant Oasis access to the Wells in the location(s) shown on the plats attached hereto as Exhibit "A".

Upon written request and the granting of a full release by the Owners of further Restoration by Oasis with respect to the affected area described in this paragraph, Oasis shall leave in place any road built by it in its Operations for the benefit of the Owners after abandoning its Operations, and shall have no further maintenance obligations with respect to any such road.

This agreement shall apply to the Parties and their respective its successors, assigns, parent and subsidiary companies, affiliates and related companies, trusts and partnerships, as well as their contractors, subcontractors, officers, directors, agents and employees.

This agreement may be executed in multiple counterparts, each of which shall be an original, but all of which shall constitute one instrument.

[Signature Page Follows.]

DATED this 13th day of December 2011

SURFACE OWNERS

Larry P. Heen, a married man dealing in his sole & separate property

Address: 14033 45th Street NW

Williston, ND 58801

Phone: 701-572-6991

STATE OF North Dakota }
} SS.
COUNTY OF McKenzie }

ACKNOWLEDGMENT INDIVIDUAL

BE IT REMEMBERED, That on this 13th day of December, 2011 before me, a Notary Public, in and for said County and State, personally appeared Larry P. Heen, a married man dealing in his sole & separate property, to me known to be the identical person described in and who executed the within and foregoing instrument and acknowledged to me that he executed the same as his free and voluntary act and deed for the uses and purposes therein set forth.

IN WITNESS WHEREOF, I have hereunto set my official signature and affixed my notarial seal, the day and year first above written.

My commission expires: April 9, 2013

Thomas A. Lenihan
Notary Public

NOTARY STAMP

THOMAS A LENIHAN
Notary Public
State of North Dakota
My Commission Expires April 9, 2013

STATE OF _____)
COUNTY OF _____)

ACKNOWLEDGMENT CORPORATION

Before me the undersigned, a Notary Public, in and for said County and State, on this ____ day of _____, 2011, personally appeared _____, to me known to be the identical person who subscribed the name of the maker thereof to the foregoing instrument as its _____ and acknowledged to me that _____ executed the same as _____ free and voluntary act and deed and as the free and voluntary act and deed of such corporation, for the uses and purposes therein set forth.

Given under my hand and seal of office the day and year last above written.

My commission expires: _____

Notary Public

NOTARY STAMP