



AUTHORIZATION TO PURCHASE AND TRANSPORT OIL FROM LEASE - FORM 8

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

Well File No.
20749

SEP 19 2024

MINERAL RESOURCES

PLEASE READ INSTRUCTIONS BEFORE FILLING OUT FORM.

PLEASE SUBMIT THE ORIGINAL.

Well Name and Number MARLENE STEFFAN 1-5-8H-141-97	Qtr-Qtr SWSE	Section 32	Township 142 N	Range 97 W	County DUNN
Operator MORNINGSTAR OPERATING LLC	Telephone Number (817) 334-8096	Field ST. ANTHONY			
Address 400 W 7TH STREET	City FORT WORTH	State TX	Zip Code 76102		

Name of First Purchaser CONCORD ENERGY	Telephone Number (303) 468-1900	% Purchased 100%	Date Effective August 31, 2024	
Principal Place of Business 1401 17TH ST SUITE 1500	City DENVER	State CO	Zip Code 80016	
Field Address 3804 17TH AVE NE	City WATFORD CITY	State ND	Zip Code 58854	
Name of Transporter BIG LEASE TRUCKING, LLC	Telephone Number (701) 764-7212	% Transported 100%	Date Effective August 31, 2024	
Address 2036 ROUGH STOCK RD	City KILLDEER	State ND	Zip Code 58640	

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

Other First Purchasers Purchasing From This Lease	% Purchased	Date Effective
Other First Purchasers Purchasing From This Lease	% Purchased	Date Effective
Other Transporters Transporting From This Lease	% Transported	Date Effective
Other Transporters Transporting From This Lease	% Transported	Date Effective
Comments		

I hereby swear or affirm that all transporters of Bakken Petroleum System oil listed above implement or adhere to a tariff specification as stringent as the Commission's VPCR₄ requirement. ☒ 13.7 VPCR₄ Tariff Specification DAPL Tariff Authority

I hereby swear or affirm that the information provided is true, complete and correct as determined from all available records.		Date 8/30/2024
Signature 	Printed Name AMY BYARS	Title REGULATORY SUPERVISOR

Above Signature Witnessed By	Witness Printed Name	Witness Title
Witness Signature 	HOLLY WOOD	REGULATORY ANALYST

FOR STATE USE ONLY

Date Approved SEP 19 2024	NDIC CTB NO 120749
By	
Title	



December 6, 2024

Morningstar Operating LLC
400 W. 7th Street
Fort Worth, TX 76102

RE: CHANGE OF OPERATOR FROM EMEP OPERATING, LLC TO MORNINGSTAR
OPERATING LLC.
61 WELLS

Dear Gentlemen,

Please find enclosed a copy of the approved Form 15, Notice of Transfer of Oil and Gas Wells, regarding the above-referenced matter. This transfer has now been approved and subject well is now covered by Bond No. B015535.

If you should have any questions, please feel free to contact this office.

Sincerely,

A handwritten signature in blue ink that reads "Rachel Whitney".

Rachel Whitney
Administrative Assistant

Enclosure.

EMEP Operating, LLC
1200 Smith St., Ste. 1500
Houston, TX 77002

**NOTICE OF TRANSFER OF OIL AND GAS WELLS - FORM 15**

DEPARTMENT OF MINERAL RESOURCES
OIL AND GAS DIVISION
600 EAST BOULEVARD DEPT 474
BISMARCK, ND 58505-0614
SFN 5762 (03-2000)

FOR STATE USE ONLY

NDIC Bond Number

701117

PLEASE READ INSTRUCTIONS BEFORE FILLING OUT FORM. PLEASE SUBMIT THE ORIGINAL AND SIX COPIES.
THIS NOTICE ALONG WITH A FEE OF \$25.00 PER WELL SHALL BE FILED AT LEAST THIRTY DAYS BEFORE THE CLOSING DATE OF TRANSFER.

TRANSFERRING OPERATOR

Name of Operator Representative Kyle Dubiel			
Operator Transferring Oil and/or Gas Wells EMEP Operating, LLC			Telephone Number (346) 261-1474
Address 1200 Smith St., Suite 1500	City Houston	State TX	Zip Code 77002
I, the above named representative, acknowledge the transfer of the oil and/or gas wells named below for the purpose of ownership and/or operation to the company named below.			
Signature 	Title (Must be an officer or power of attorney must be attached) VP Business Development, Land and Legal		Date July 24, 2024

Well File Number	Requested Official Well Name and Number	Location (Qtr-Qtr, S-T-R)	Assignment Date
	See attached Well List		August 30, 2024

RECEIVING OPERATOR

Name of Operator Representative Allen L. Armstrong, Jr.			
Operator Receiving Oil and/or Gas Wells MorningStar Operating LLC			Telephone Number (817) 334-7811
Address 400 W. 7th Street	City Fort Worth	State TX	Zip Code 76102
I, the above named representative, have read the foregoing statement and accept such transfer, also the responsibility of ownership and/or operation of said well or wells, under the said company bond, said bond being tendered to or on file with the Industrial Commission of North Dakota.			
Signature 	Title (Must be an officer or power of attorney must be attached) Vice President - Land, Permian		Date August 27, 2024

SURETY COMPANY

Surety U.S. Specialty Insurance Company		Telephone Number (713) 355-3100		Amount of Bond \$ 100,000.00
Address 13403 Northwest Freeway	City Houston	State TX	Zip Code 77040	Bond Number 3015535
The above named SURETY agrees that such bond shall extend to compliance with Chapter 38-08 of North Dakota Century Code and amendments and the rules and regulations of the Industrial Commission of North Dakota prescribed to govern the production of oil and gas on government and private lands within the State of North Dakota, in relation to the above stated transfer; it being further agreed and understood that the bond sum or amount is not to be considered increased because of such extension.				
Signature 	Title (Must be an officer or power of attorney must be attached) Attorney-in-Fact		Date July 30, 2024	
Printed Name Michele K. Tyson				

FOR STATE USE ONLY

Date Approved December 6, 2024
By
Title Field Supervisor

Well Exhibit

Attached to that certain Notice of Transfer of Oil and Gas Wells - Form 15, from EMEP Operating, LLC, to MorningStar Operating LLC, effective August 30, 2024.

API	Well Name	Operator Name	State	County	Section**	Township**	Range**	Qtr Qtr	Field	NDIC Bond
33025011600000	ALFRED SADOWSKY 1-36-1H-141-96	EMEP Operating, LLC	ND	DUNN	SEC 36	T142N	R96W	NENW	RUSSIAN CREEK	700479
33025015460000	BILL CODY 1-20-29H-141-96	EMEP Operating, LLC	ND	DUNN	SEC 20	T141N	R96W	NWNE	ST. ANTHONY	700479
33025016230000	BINSTOCK 1-34-27H-142-96	EMEP Operating, LLC	ND	DUNN	SEC 34	T142N	R96W	SWSW	RUSSIAN CREEK	700479
33025018400000	CHARLES DAVIS 1-4-9H-142-94	EMEP Operating, LLC	ND	DUNN	SEC 4	T142N	R94W	LOT2	MURPHY CREEK	700597
33025014920000	COYOTE CREEK 1-20-17H-142-97	EMEP Operating, LLC	ND	DUNN	SEC 20	T142N	R97W	SESW	WILLMEN	700479
33025007590000	DVORAK 10-1H	EMEP Operating, LLC	ND	DUNN	SEC 10	T142N	R95W	SESW	MURPHY CREEK	700479
33025005780000	DVORAK 11-4H	EMEP Operating, LLC	ND	DUNN	SEC 4	T141N	R96W	NWNE	RUSSIAN CREEK	700479
33025013000000	DVORAK TRUST 1-6-31H-142-96	EMEP Operating, LLC	ND	DUNN	SEC 6	T141N	R96W	SESW	RUSSIAN CREEK	700479
33025016260000	EASTON 1-35-26H-142-95	EMEP Operating, LLC	ND	DUNN	SEC 35	T142N	R95W	SWSE	MURPHY CREEK	700479
33025012430000	ELSIE DVORAK 1-8-17H-141-96	EMEP Operating, LLC	ND	DUNN	SEC 8	T141N	R96W	NWNE	ST. ANTHONY	700479
33025014940000	FEDERAL ANNIE OAKLEY 1-20-17H-142-94	EMEP Operating, LLC	ND	DUNN	SEC 29	T142N	R94W	NWNE	MURPHY CREEK	700479
33025011550000	FISHER STATE 1-21-16H-142-97	EMEP Operating, LLC	ND	DUNN	SEC 21	T142N	R97W	SESW	WILLMEN	700479
33025018110000	FRANK ANDERS 1-27-34H-142-95	EMEP Operating, LLC	ND	DUNN	SEC 27	T142N	R95W	NENW	MURPHY CREEK	700479
33025012380000	GORDON PAVLICEK 1-17-20H-141-95	EMEP Operating, LLC	ND	DUNN	SEC 17	T141N	R95W	NENW	SIMON BUTTE	700479
33025013600000	GEORGE MILLER 1-11-2H-142-95	EMEP Operating, LLC	ND	DUNN	SEC 11	T142N	R95W	SWSE	MURPHY CREEK	700479
33025016270000	HATTIE DVORAK 1-33-28H-142-96	EMEP Operating, LLC	ND	DUNN	SEC 33	T142N	R96W	SWSW	RUSSIAN CREEK	700479
33025015750000	HAVELKA 1-19-18H-142-95	EMEP Operating, LLC	ND	DUNN	SEC 19	T142N	R95W	SWSE	MANNING	700479
33025018790000	HENRY GURKE 1-30-19H-141-96	EMEP Operating, LLC	ND	DUNN	SEC 30	T141N	R96W	SESE	ST. ANTHONY	700479
33025009610000	JAEGER 1-10-15H-141-96	EMEP Operating, LLC	ND	DUNN	SEC 10	T141N	R96W	NWNE	ST. ANTHONY	700479
33007017780000	JOHN KINNE 1-27-34H-142-98	EMEP Operating, LLC	ND	BILLINGS	SEC 22	T142N	R98W	SESW	SNOW	700598
33007018180000	JOHN KINNE 2-27-34H-142-98	EMEP Operating, LLC	ND	BILLINGS	SEC 22	T142N	R98W	SESW	SNOW	700479
33025018180000	JOSEPH CARTER 1-13-12H-141-96	EMEP Operating, LLC	ND	DUNN	SEC 13	T141N	R96W	SESW	ST. ANTHONY	700479
33025008940000	KADRMAS 11-27H	EMEP Operating, LLC	ND	DUNN	SEC 27	T141N	R95W	NENW	SIMON BUTTE	700479
33025013590000	KATIE KEISER 1-12-14H-142-95	EMEP Operating, LLC	ND	DUNN	SEC 12	T142N	R95W	SWSE	MURPHY CREEK	700479
33025015370000	KEARY KADRMAS 1-32-29H-142-96	EMEP Operating, LLC	ND	DUNN	SEC 32	T142N	R96W	SESW	RUSSIAN CREEK	700479
33025022740000	KEARY KADRMAS 2-32-29H-142-96	EMEP Operating, LLC	ND	DUNN	SEC 32	T142N	R96W	SESW	RUSSIAN CREEK	700479
33025013510000	KUDRNA 1-17	EMEP Operating, LLC	ND	DUNN	SEC 17	T141N	R97W	SWSE	ST. ANTHONY	700532
33007017440000	KUNTZ 1-23-14H-142-98	EMEP Operating, LLC	ND	BILLINGS	SEC 23	T142N	R98W	SESW	SADDLE BUTTE	700479
33025018800000	LOREN HAGEN 1-35-26H-141-97	EMEP Operating, LLC	ND	DUNN	SEC 35	T141N	R97W	SWSE	ST. ANTHONY	700479
33025016110000	LOUIE PAVLICEK 1-28-33H-142-97	EMEP Operating, LLC	ND	DUNN	SEC 28	T142N	R97W	NWNE	WILLMEN	700479
33025013580000	MARLENE STEFFAN 1-5-8H-141-97	EMEP Operating, LLC	ND	DUNN	SEC 32	T142N	R97W	NWNE	ST. ANTHONY	700479
33025014390000	MAURICE HECKER 1-19-18H-142-97	EMEP Operating, LLC	ND	DUNN	SEC 19	T142N	R97W	SESE	WILLMEN	700600
33025024920000	MAURICE HECKER 2-19-18H-142-97	EMEP Operating, LLC	ND	DUNN	SEC 19	T142N	R97W	SESE	WILLMEN	700479
33025018480000	MEDUNA TRUST 1-7-6H-142-94	EMEP Operating, LLC	ND	DUNN	SEC 7	T142N	R94W	SESW	MURPHY CREEK	700479
33025015690000	MONGOOSE 1-13-24H-142-95	EMEP Operating, LLC	ND	DUNN	SEC 12	T142N	R95W	SESE	MURPHY CREEK	700479
33025018700000	NELS WOLD 1-36-25H-141-97	EMEP Operating, LLC	ND	DUNN	SEC 36	T141N	R97W	SWSW	ST. ANTHONY	700479
33025012260000	NOVASIO STATE 1-16-21H-142-95	EMEP Operating, LLC	ND	DUNN	SEC 16	T142N	R95W	NWNE	MURPHY CREEK	700479
33025005810000	PAVLICEK 44-32H	EMEP Operating, LLC	ND	DUNN	SEC 32	T142N	R97W	SESE	WILLMEN	700531
33025014870000	PRIVRATSKY 1-28-33H-141-95	EMEP Operating, LLC	ND	DUNN	SEC 28	T141N	R95W	NENW	SIMON BUTTE	700479
33025015720000	RICHARD JABLONSKY 1-13-24H-141-97	EMEP Operating, LLC	ND	DUNN	SEC 12	T141N	R97W	SWSE	ST. ANTHONY	700479
33007017790000	RICHARD LONGFELLOW 1-22-15H-142-98	EMEP Operating, LLC	ND	BILLINGS	SEC 22	T142N	R98W	SESW	SADDLE BUTTE	700479
33089007390000	RC-SVHL-140-95-0706H-1	EMEP Operating, LLC	ND	STARK	SEC 7	T140N	R95W	SESW	DAVIS BUTTES	700479
33025018710000	RIDL 1-24-25H-142-96	EMEP Operating, LLC	ND	DUNN	SEC 24	T142N	R96W	NENW	RUSSIAN CREEK	700479
33025017310000	STATE LITTLE KNIFE 1-20-17H-142-95	EMEP Operating, LLC	ND	DUNN	SEC 20	T142N	R95W	SWSE	MANNING	700479
33025033890000	SADOWSKY 14-11-2H	EMEP Operating, LLC	ND	DUNN	SEC 14	T141N	R96W	SESE	ST. ANTHONY	700479
33025008680000	SADOWSKY 24-14H	EMEP Operating, LLC	ND	DUNN	SEC 14	T141N	R96W	SESW	ST. ANTHONY	700479
33025017300000	SCHAFNER 1-29-32H-142-95	EMEP Operating, LLC	ND	DUNN	SEC 20	T142N	R95W	SWSE	MANNING	700479
33025007320000	SICKLER 22-1H	EMEP Operating, LLC	ND	DUNN	SEC 22	T142N	R94W	SESW	MURPHY CREEK	700480
33025009020000	SICKLER STATE 21-4H	EMEP Operating, LLC	ND	DUNN	SEC 4	T141N	R95W	LOT3	SIMON BUTTE	700599
33025016130000	STATE JABLONSKY B 1-36-25H-142-95	EMEP Operating, LLC	ND	DUNN	SEC 36	T142N	R95W	SESW	MURPHY CREEK	700479
33025015840000	STATE LITTLE MISSOURI 1-30-31H-142-95	EMEP Operating, LLC	ND	DUNN	SEC 19	T142N	R95W	SWSE	MANNING	700479
33025012630000	STATE DVORAK 1-9-16H-141-96	EMEP Operating, LLC	ND	DUNN	SEC 9	T141N	R96W	NWNE	ST. ANTHONY	700479
33025017010000	STATE FRANK BUTLER 1-29-32H-142-94	EMEP Operating, LLC	ND	DUNN	SEC 29	T142N	R94W	NWNE	MURPHY CREEK	700479
33025016120000	STATE FISHER 2-21-16H-142-97	EMEP Operating, LLC	ND	DUNN	SEC 28	T142N	R97W	NWNE	WILLMEN	700479
33025014930000	STATE JABLONSKY 1-1-12H-141-95	EMEP Operating, LLC	ND	DUNN	SEC 36	T142N	R95W	SESW	SIMON BUTTE	700479
33025012990000	STATE JAEGER 1-21-16H-142-94	EMEP Operating, LLC	ND	DUNN	SEC 21	T142N	R94W	SWSW	MURPHY CREEK	700479
33025013080000	STATE MARSH 1-34-27H-142-97	EMEP Operating, LLC	ND	DUNN	SEC 34	T142N	R97W	SESW	WILLMEN	700479
33025013040000	STATE POLENSKY 1-35-36H-142-97	EMEP Operating, LLC	ND	DUNN	SEC 35	T142N	R97W	NWSW	WILLMEN	700479
33025013370000	TERRY DVORAK 1-15-22H-142-95	EMEP Operating, LLC	ND	DUNN	SEC 15	T142N	R95W	NENE	MURPHY CREEK	700479
33025011110000	WOLBERG 21-18H	EMEP Operating, LLC	ND	DUNN	SEC 18	T141N	R95W	NENW	SIMON BUTTE	700479
33025019500000	WOODROW KEEBLE 1-21-22H-141-96	EMEP Operating, LLC	ND	DUNN	SEC 21	T141N	R96W	SWSW	ST. ANTHONY	700479



TOKIO MARINE
HCC

POWER OF ATTORNEY

AMERICAN CONTRACTORS INDEMNITY COMPANY TEXAS BONDING COMPANY
UNITED STATES SURETY COMPANY U.S. SPECIALTY INSURANCE COMPANY

KNOW ALL MEN BY THESE PRESENTS: That American Contractors Indemnity Company, a California corporation, Texas Bonding Company, an assumed name of American Contractors Indemnity Company, United States Surety Company, a Maryland corporation and U.S. Specialty Insurance Company, a Texas corporation (collectively, the "Companies"), do by these presents make, constitute and appoint:

Edwin H. Frank, III, Michele K. Tyson, Meredith K. Anderson, Stephen Michael Smith, Timothy J. Briggs
or Roxanne J. Molinar of Houston, Texas

its true and lawful Attorney(s)-in-fact, each in their separate capacity if more than one is named above, with full power and authority hereby conferred in its name, place and stead, to execute, acknowledge and deliver **any and all bonds, recognizances, undertakings or other instruments or contracts of suretyship to include riders, amendments, and consents of surety, providing the bond penalty does not exceed** *****Three Million***** Dollars (***3,000,000.00***).

This Power of Attorney shall expire without further action on January 31st 2028. This Power of Attorney is granted under and by authority of the following resolutions adopted by the Boards of Directors of the Companies:

Be it Resolved, that the President, any Vice-President, any Assistant Vice-President, any Secretary or any Assistant Secretary shall be and is hereby vested with full power and authority to appoint any one or more suitable persons as Attorney(s)-in-Fact to represent and act for and on behalf of the Company subject to the following provisions:

Attorney-in-Fact may be given full power and authority for and in the name of and on behalf of the Company, to execute, acknowledge and deliver, any and all bonds, recognizances, contracts, agreements or indemnity and other conditional or obligatory undertakings, including any and all consents for the release of retained percentages and/or final estimates on engineering and construction contracts, and any and all notices and documents canceling or terminating the Company's liability thereunder, and any such instruments so executed by any such Attorney-in-Fact shall be binding upon the Company as if signed by the President and sealed and effected by the Corporate Secretary.

Be it Resolved, that the signature of any authorized officer and seal of the Company heretofore or hereafter affixed to any power of attorney or any certificate relating thereto by facsimile, and any power of attorney or certificate bearing facsimile signature or facsimile seal shall be valid and binding upon the Company with respect to any bond or undertaking to which it is attached.

IN WITNESS WHEREOF, The Companies have caused this instrument to be signed and their corporate seals to be hereto affixed, this 1st day of February 2024.



AMERICAN CONTRACTORS INDEMNITY COMPANY, TEXAS
BONDING COMPANY, UNITED STATES SURETY COMPANY,
U.S. SPECIALTY INSURANCE COMPANY

By: _____

Daniel P. Aguilar, Vice President

A Notary Public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

State of California
County of Los Angeles

On this 1st day of February 2024, before me, D. Littlefield, a notary public, personally appeared Daniel P. Aguilar, Vice President of American Contractors Indemnity Company, Texas Bonding Company, United States Surety Company and U.S. Specialty Insurance Company who proved to me on the basis of satisfactory evidence to be the person whose name is subscribed to the within instrument and acknowledged to me that he executed the same in his authorized capacity, and that by his signature on the instrument the person, or the entity upon behalf of which the person acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature _____

D. Littlefield

(seal)

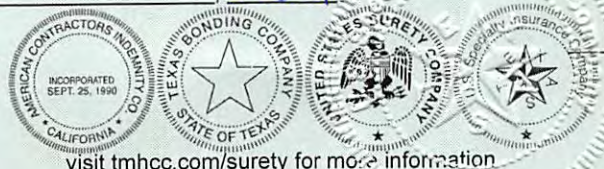


I, Kio Lo, Assistant Secretary of American Contractors Indemnity Company, Texas Bonding Company, United States Surety Company and U.S. Specialty Insurance Company, do hereby certify that the above and foregoing is a true and correct copy of a Power of Attorney, executed by said Companies, which is still in full force and effect; furthermore, the resolutions of the Boards of Directors, set out in the Power of Attorney are in full force and effect.

In Witness Whereof, I have hereunto set my hand and affixed the seals of said Companies at Los Angeles, California this 30th day of July, 2024

Bond No. B015535

Agency No. 8353



Kio Lo, Assistant Secretary

HCCSMANPOA02/2024

visit tmhcc.com/surety for more information



From: Be Legendary.™
Sent: Wednesday, October 30, 2024 12:20 PM
To: Whitney, Rachel
Subject: RE: Bond release

***** CAUTION: This email originated from an outside source. Do not click links or open attachments unless you know they are safe. *****

Ok got it, thanks Rachel.

As to the flowlines, there aren't any owned flowlines to or from the well pads, so nothing was submitted or should be needed there.

Thanks,
-Kyle

From: Whitney, Rachel <rlwhitney@nd.gov>
Sent: Wednesday, October 30, 2024 11:37 AM
To: Kyle Dubiel <kdubiel@em-ep.com>
Subject: RE: Bond release

[EXTERNAL EMAIL] - DO NOT CLICK links or open attachments unless you recognize the sender and know the content is safe.

We're getting closer to the end with just a few departments left to review.

Did you submit flowlines for this transfer yet? We'll need those if there are any owned flowlines going to or from the well pads.

Thank you,

Rachel Whitney
Administrative Assistant II

701.328.8040 (o) • rlwhitney@nd.gov • www.dmr.nd.gov

From: Kyle Dubiel <kdubiel@em-ep.com>
Sent: Wednesday, October 30, 2024 11:34 AM

**AUTHORIZATION TO PURCHASE AND TRANSPORT OIL FROM LEASE FORM 8**

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



Well File No.
20749

PLEASE READ INSTRUCTIONS BEFORE FILLING OUT FORM.
PLEASE SUBMIT THE ORIGINAL.

Well Name and Number MARLENE STEFFAN 1-5-8H-141-97	Qtr-Qtr SWSE	Section 32	Township 142N	Range 97W	County DUNN
Operator EMEP Operating, LLC	Telephone Number 346-261-1472	Field ST. ANTHONY			
Address Two Allen Center, 1200 Smith St., Suite 680	City Houston	State TX	Zip Code 77002		

Name of First Purchaser Concord Energy	Telephone Number (303) 468-1900	% Purchased 100%	Date Effective November 1, 2021	
Principal Place of Business 1401 17TH STR SUITE 1500	City Denver	State CO	Zip Code 80016	
Field Address 3804 17TH Ave NE	City Watford City	State ND	Zip Code 58854	
Name of Transporter BIG LEASE TRUCKING, LLC	Telephone Number (701) 764-7212	% Transported 100%	Date Effective November 1, 2021	
Address 2036 ROUGH STOCK ROAD	City KILLDEER	State ND	Zip Code 58640	

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

Other First Purchasers Purchasing From This Lease	% Purchased	Date Effective
Other First Purchasers Purchasing From This Lease	% Purchased	Date Effective
Other Transporters Transporting From This Lease	% Transported	Date Effective
Other Transporters Transporting From This Lease	% Transported	Date Effective
Comments		

I hereby swear or affirm that all transporters of Bakken Petroleum System oil listed above implement or adhere to a tariff specification as stringent as the Commissions VPCR₄ requirement ☐ _____ VPCR₄ Tariff Specification _____ Tariff Authority

I hereby swear or affirm that the information provided is true, complete and correct as determined from all available records.		Date December 20, 2021
Signature 	Printed Name Kyle Dubiel	Title Vice President BD, Land and Legal

Above Signature Witnessed By	Witness Printed Name Michael DeKruif	Witness Title Vice President Engineering
Witness Signature 		

FOR STATE USE ONLY

Date Approved SEP 02 2022	NDIC CTB NO 120749
By 	
Title Oil & Gas Production Analyst	



July 6, 2022

EMEP Operating, LLC
Two Allen Center, 1200 Smith St.
Suite 680
Houston, TX 77002

RE: CHANGE OF OPERATOR FROM ENERPLUS RESOURCES (USA)
CORPORATION TO EMEP OPERATING, LLC.
50 Wells

Dear Gentlemen,

Please find enclosed a copy of the approved Form 15, Notice of Transfer of Oil and Gas Wells, regarding the above-referenced matter. This transfer has now been approved and subject well is now covered by Bond No. B013758.

If you should have any questions, please feel free to contact this office.

Sincerely,

A handwritten signature in blue ink, appearing to read "Rachel Morris".

Rachel Morris
Administrative Assistant

**NOTICE OF TRANSFER OF OIL AND GAS WELLS - FORM 15**

INDUSTRIAL COMMISSION OF NORTH DAKOTA
OIL AND GAS DIVISION
600 EAST BOULEVARD DEPT 405
BISMARCK, ND 58505-0840
SFN 5762 (03-2000)



FOR STATE USE ONLY

NDIC Bond Number

700479

PLEASE READ INSTRUCTIONS BEFORE FILLING OUT FORM. PLEASE SUBMIT THE ORIGINAL AND SIX COPIES.
THIS NOTICE ALONG WITH A FEE OF \$25.00 PER WELL SHALL BE FILED AT LEAST THIRTY DAYS BEFORE THE CLOSING DATE OF TRANSFER.

TRANSFERRING OPERATOR

Name of Operator Representative Nathan Fisher			
Operator Transferring Oil and/or Gas Wells Enerplus Resources (USA) Corporation			Telephone Number (720) 279-5500
Address 950 17th Street Suite 2200	City Denver	State CO	Zip Code 80202
I, the above named representative, acknowledge the transfer of the oil and/or gas wells named below for the purpose of ownership and/or operation to the company named below.			
Signature 	Title (Must be an officer or power of attorney must be attached) VP, US Business Unit		Date 10/5/21

Well File Number	Requested Official Well Name and Number	Location (Qtr-Qtr, S-T-R)	Assignment Date
	See attached list of wells		November 1, 2021

RECEIVING OPERATOR

Name of Operator Representative Kyle Dubiel			
Operator Receiving Oil and/or Gas Wells EMEP Operating, LLC			Telephone Number (346) 261-1474
Address 1200 Allen Center, 1200 Smith St. Suite 680	City Houston	State TX	Zip Code 77002
I, the above named representative, have read the foregoing statement and accept such transfer, also the responsibility of ownership and/or operation of said well or wells, under the said company bond, said bond being tendered to or on file with the Industrial Commission of North Dakota.			
Signature 	Title (Must be an officer or power of attorney must be attached) VP BD, Land & Legal		Date 10/5/21

SURETY COMPANY

Surety U.S. Specialty Insurance Company		Telephone Number (713) 355-3100		Amount of Bond \$100,000.00	
Address 777 Post Oak Blvd., Suite 330	City Houston	State TX	Zip Code 77056	Bond Number B013758	
The above named SURETY agrees that such bond shall extend to compliance with Chapter 38-08 of North Dakota Century Code and amendments and the rules and regulations of the Industrial Commission of North Dakota prescribed to govern the production of oil and gas on government and private lands within the State of North Dakota, in relation to the above stated transfer; it being further agreed and understood that the bond sum or amount is not to be considered increased because of such extension.					
Signature 		Title (Must be an officer or power of attorney must be attached) Attorney-in-Fact		Date 10/19/2021	
Printed Name Edwin H. Frank, III					

FOR STATE USE ONLY

Date Approved July 6, 2022
By
Title Assistant Director

API	File No.	Operator Name	Well Name	Well Type	Well Status	County	Field	PLSS	Sec	Twp	Rng	NDIC	Bound
3302500578	16178	ENERPLUS RESOURCES USA CORPORATION	DVORAK 11-4H	Oil & Gas	Active	Dunn	RUSSIAN CREEK	04, 141N, 96W, 5th	04	141N	96W	700291	
3302500759	17234	ENERPLUS RESOURCES USA CORPORATION	DVORAK 10-4H	Oil & Gas	Active	Dunn	MURPHY CREEK	10, 142N, 95W, 5th	10	142N	95W	700291	
3302500868	17808	ENERPLUS RESOURCES USA CORPORATION	SADOWSKY 24-14H	Oil & Gas	Active	Dunn	ST ANTHONY	14, 141N, 96W, 5th	14	141N	96W	700291	
3302500894	17961	ENERPLUS RESOURCES USA CORPORATION	KADRMAS 11-27H	Oil & Gas	Active	Dunn	SIMON BUTTE	27, 141N, 95W, 5th	27	141N	95W	700291	
3302500920	18056	ENERPLUS RESOURCES USA CORPORATION	SADOWSKY 34-12H	Oil & Gas	Active	Dunn	ST. ANTHONY	12, 141N, 97W, 5th	12	141N	97W	700291	
3302500961	18272	ENERPLUS RESOURCES USA CORPORATION	JAEGER 1-10-15H-141-96	Oil & Gas	Active	Dunn	ST. ANTHONY	10, 141N, 96W, 5th	10	141N	96W	700291	
3302501111	19088	ENERPLUS RESOURCES USA CORPORATION	WOLBERG 21-18H	Oil & Gas	Active	Dunn	SIMON BUTTE	18, 141N, 95W, 5th	18	141N	95W	700291	
3302501155	19438	ENERPLUS RESOURCES USA CORPORATION	FISHER STATE 1-21-16H-142-97	Oil & Gas	Active	Dunn	WILLMEN	21, 142N, 97W, 5th	21	142N	97W	700291	
3302501160	19494	ENERPLUS RESOURCES USA CORPORATION	ALFRED SADOWSKY 1-36-1H-141-96	Oil & Gas	Active	Dunn	RUSSIAN CREEK	36, 142N, 96W, 5th	36	142N	96W	700291	
3302501226	20024	ENERPLUS RESOURCES USA CORPORATION	NOVASIO STATE 1-16-21H-142-95	Oil & Gas	Active	Dunn	MURPHY CREEK	16, 142N, 95W, 5th	16	142N	95W	700291	
3302501238	20092	ENERPLUS RESOURCES USA CORPORATION	GORDON PAVLICEK 1-17-20H-141-95	Oil & Gas	Active	Dunn	SIMON BUTTE	17, 141N, 95W, 5th	17	141N	95W	700291	
3302501243	20104	ENERPLUS RESOURCES USA CORPORATION	ELSIE DVORAK 1-8-17H-141-96	Oil & Gas	Active	Dunn	ST. ANTHONY	08, 141N, 96W, 5th	08	141N	96W	700291	
3302501263	20218	ENERPLUS RESOURCES USA CORPORATION	STATE DVORAK 1-9-16H-141-96	Oil & Gas	Active	Dunn	ST. ANTHONY	09, 141N, 96W, 5th	9	141N	96W	700291	
3302501299	20411	ENERPLUS RESOURCES USA CORPORATION	STATE JAEGER 1-21-16H-142-94	Oil & Gas	Inactive (Shut-In >= 3 and <= 12 Months)	Dunn	MURPHY CREEK	21, 142N, 94W, 5th	21	142N	94W	700291	
3302501300	20416	ENERPLUS RESOURCES USA CORPORATION	DVORAK TRUST 1-6-31H-142-96	Oil & Gas	Active	Dunn	RUSSIAN CREEK	06, 141N, 96W, 5th	06	141N	96W	700291	
3302501304	20425	ENERPLUS RESOURCES USA CORPORATION	STATE POLENSKY 1-35-36H-142-97	Oil & Gas	Active	Dunn	WILLMEN	35, 142N, 97W, 5th	35	142N	97W	700291	
3302501308	20441	ENERPLUS RESOURCES USA CORPORATION	STATE MARSH 1-34-27H-142-97	Oil & Gas	Active	Dunn	WILLMEN	34, 142N, 97W, 5th	34	142N	97W	700291	
3302501337	20580	ENERPLUS RESOURCES USA CORPORATION	TERRY DVORAK 1-15-22H-142-95	Oil & Gas	Active	Dunn	MURPHY CREEK	15, 142N, 95W, 5th	15	142N	95W	700291	
3302501358	20749	ENERPLUS RESOURCES USA CORPORATION	MARLENE STEFFAN 1-5-8H-141-97	Oil & Gas	Active	Dunn	ST ANTHONY	32, 142N, 97W, 5th	32	142N	97W	700291	
3302501359	20750	ENERPLUS RESOURCES USA CORPORATION	KATIE HEISER 1-12-1H-142-95	Oil & Gas	Active	Dunn	MURPHY CREEK	12, 142N, 95W, 5th	12	142N	95W	700291	
3302501360	20765	ENERPLUS RESOURCES USA CORPORATION	GEORGE MILLER 1-11-2H-142-95	Oil & Gas	Active	Dunn	MURPHY CREEK	11, 142N, 95W, 5th	11	142N	95W	700291	
3302501487	21606	ENERPLUS RESOURCES USA CORPORATION	PRIVRATSKY 1-28-33H-141-95	Oil & Gas	Active	Dunn	SIMON BUTTE	28, 141N, 95W, 5th	28	141N	95W	700291	
3302501492	21642	ENERPLUS RESOURCES USA CORPORATION	COYOTE CREEK 1-20-17H-142-97	Oil & Gas	Active	Dunn	WILLMEN	20, 142N, 97W, 5th	20	142N	97W	700291	
3302501493	21669	ENERPLUS RESOURCES USA CORPORATION	STATE JABLONSKY 1-1-12H-141-95	Oil & Gas	Active	Dunn	SIMON BUTTE	36, 142N, 95W, 5th	36	142N	95W	700291	
3302501494	21674	ENERPLUS RESOURCES USA CORPORATION	FEDERAL ANNIE OAKLEY 1-20-17H-142-94	Oil & Gas	Inactive (Shut-In >= 3 and <= 12 Months)	Dunn	MURPHY CREEK	29, 142N, 94W, 5th	29	142N	94W	700291	
3302501537	21844	ENERPLUS RESOURCES USA CORPORATION	KEARY KADRMAS 1-32-29H-142-96	Oil & Gas	Active	Dunn	RUSSIAN CREEK	32, 142N, 96W, 5th	32	142N	96W	700291	
3302501546	21913	ENERPLUS RESOURCES USA CORPORATION	BILL CODY 1-20-29H-141-96	Oil & Gas	Active	Dunn	ST. ANTHONY	20, 141N, 96W, 5th	20	141N	96W	700291	
3302501569	22133	ENERPLUS RESOURCES USA CORPORATION	MONGOOSE 1-13-24H-142-95	Oil & Gas	Active	Dunn	MURPHY CREEK	12, 142N, 95W, 5th	12	142N	95W	700291	
3302501572	22150	ENERPLUS RESOURCES USA CORPORATION	RICHARD JABLONSKY 1-13-24H-141-97	Oil & Gas	Active	Dunn	ST ANTHONY	12, 141N, 97W, 5th	12	141N	97W	700291	
3302501575	22172	ENERPLUS RESOURCES USA CORPORATION	HAVELKA 1-19-18H-142-95	Oil & Gas	Active	Dunn	MANNING	19, 142N, 95W, 5th	19	142N	95W	700291	
3302501584	22234	ENERPLUS RESOURCES USA CORPORATION	STATE LITTLE MISSOURI 1-30-31H-142-95	Oil & Gas	Active	Dunn	MANNING	19, 142N, 95W, 5th	19	142N	95W	700291	

3302501611	22351	ENERPLUS RESOURCES USA CORPORATION	LOUIE PAVLICEK 1-28-33H-142-97	Oil & Gas	Active	Dunn	WILLMEN	28, 142N, 97W, 5th	28	142N	97W	700291
3302501612	22352	ENERPLUS RESOURCES USA CORPORATION	STATE FISHER 2-21-16H-142-97	Oil & Gas	Active	Dunn	WILLMEN	28, 142N, 97W, 5th	28	142N	97W	700291
3302501613	22369	ENERPLUS RESOURCES USA CORPORATION	STATE JABLONSKY B 1-36-25H-142-95	Oil & Gas	Active	Dunn	MURPHY CREEK	36, 142N, 95W, 5th	36	142N	95W	700291
3302501623	22441	ENERPLUS RESOURCES USA CORPORATION	BINSTOCK 1-34-27H-142-96	Oil & Gas	Active	Dunn	RUSSIAN CREEK	34, 142N, 96W, 5th	34	142N	96W	700291
3302501626	22444	ENERPLUS RESOURCES USA CORPORATION	EASTON 1-35-26H-142-95	Oil & Gas	Active	Dunn	MURPHY CREEK	35, 142N, 95W, 5th	35	142N	95W	700291
3302501627	22445	ENERPLUS RESOURCES USA CORPORATION	HATTIE DVORAK 1-33-28H-142-96	Oil & Gas	Active	Dunn	RUSSIAN CREEK	33, 142N, 96W, 5th	33	142N	96W	700291
3302501701	22881	ENERPLUS RESOURCES USA CORPORATION	STATE FRANK BUTLER 1-29-32H-142-94	Oil & Gas	Active	Dunn	MURPHY CREEK	29, 142N, 94W, 5th	29	142N	94W	700291
3302501730	22984	ENERPLUS RESOURCES USA CORPORATION	SCHAFNER 1-29-32H-142-95	Oil & Gas	Active	Dunn	MANNING	20, 142N, 95W, 5th	20	142N	95W	700291
3302501731	22985	ENERPLUS RESOURCES USA CORPORATION	STATE LITTLE KNIFE 1-20-17H-142-95	Oil & Gas	Active	Dunn	MANNING	20, 142N, 95W, 5th	20	142N	95W	700291
3300701744	23088	ENERPLUS RESOURCES USA CORPORATION	KUNTZ 1-23-14H-142-98	Oil & Gas	Active	Billings	SADDLE BUTTE	23, 142N, 98W, 5th	23	142N	98W	700291
3302501811	23353	ENERPLUS RESOURCES USA CORPORATION	FRANK ANDERS 1-27-34H-142-95	Oil & Gas	Active	Dunn	MURPHY CREEK	27, 142N, 95W, 5th	27	142N	95W	700291
3302501818	23384	ENERPLUS RESOURCES USA CORPORATION	JOSEPH CARTER 1-13-12H-141-96	Oil & Gas	Active	Dunn	ST. ANTHONY	13, 141N, 96W, 5th	13	141N	96W	700291
3302501848	23685	ENERPLUS RESOURCES USA CORPORATION	MEDUNA TRUST 1-7-6H-142-94	Oil & Gas	Active	Dunn	MURPHY CREEK	07, 142N, 94W, 5th	07	142N	94W	700291
3308900739	23771	ENERPLUS RESOURCES USA CORPORATION	RC-SVIHL-140-95-0706H-1	Oil & Gas	Active	Stark	DAVIS BUTTES	07, 140N, 95W, 5th	7	140N	95W	700291
3302501870	23844	ENERPLUS RESOURCES USA CORPORATION	NELS WOLD 1-36-25H-141-97	Oil & Gas	Active	Dunn	ST. ANTHONY	36, 141N, 97W, 5th	36	141N	97W	700291
3302501871	23845	ENERPLUS RESOURCES USA CORPORATION	RIDL 1-24-25H-142-96	Oil & Gas	Active	Dunn	RUSSIAN CREEK	24, 142N, 96W, 5th	24	142N	96W	700291
3302501879	23928	ENERPLUS RESOURCES USA CORPORATION	HENRY GURKE 1-30-19H-141-96	Oil & Gas	Active	Dunn	ST. ANTHONY	30, 141N, 96W, 5th	30	141N	96W	700291
3302501880	23932	ENERPLUS RESOURCES USA CORPORATION	LOREN HAGEN 1-35-26H-141-97	Oil & Gas	Active	Dunn	ST. ANTHONY	35, 141N, 97W, 5th	35	141N	97W	700291
3302501950	24210	ENERPLUS RESOURCES USA CORPORATION	WOODROW KEEBLE 1-21-22H-141-96	Oil & Gas	Active	Dunn	ST. ANTHONY	21, 141N, 96W, 5th	21	141N	96W	700291
3300701779	24717	ENERPLUS RESOURCES USA CORPORATION	RICHARD LONGFELLOW 1-22-45H-142-98	Oil & Gas	Active	Billings	SADDLE BUTTE	22, 142N, 98W, 5th	22	142N	98W	700291
3302502274	26366	ENERPLUS RESOURCES USA CORPORATION	KEARY KADRMAS 2-32-29H-142-96	Oil & Gas	Active	Dunn	RUSSIAN CREEK	32, 142N, 96W, 5th	32	142N	96W	700291
3300701818	27543	ENERPLUS RESOURCES USA CORPORATION	JOHN KINNE 2-27-34H-142-98	Oil & Gas	Active	Billings	SNOW	22, 142N, 98W, 5th	22	142N	98W	700291
3302502492	27888	ENERPLUS RESOURCES USA CORPORATION	MAURICE HECKER 2-19-18H-142-97	Oil & Gas	Active	Dunn	WILLMEN	19, 142N, 97W, 5th	19	142N	97W	700291
3302503389	34254	ENERPLUS RESOURCES USA CORPORATION	SADOWSKY 14-11-2H	Oil & Gas	Inactive (Shut-In >= 3 and <= 12 Months)	Dunn	ST. ANTHONY	14, 141N, 96W, 5th	14	141N	96W	700291



TOKIOMARINE
HCC

POWER OF ATTORNEY

AMERICAN CONTRACTORS INDEMNITY COMPANY TEXAS BONDING COMPANY
UNITED STATES SURETY COMPANY U.S. SPECIALTY INSURANCE COMPANY

KNOW ALL MEN BY THESE PRESENTS: That American Contractors Indemnity Company, a California corporation, Texas Bonding Company, an assumed name of American Contractors Indemnity Company, United States Surety Company, a Maryland corporation and U.S. Specialty Insurance Company, a Texas corporation (collectively, the "Companies"), do by these presents make, constitute and appoint:

Edwin H. Frank, III, Michele K. Tyson, Meredith K. Anderson, Stephen Michael Smith or
Timothy J. Briggs of Houston, Texas

its true and lawful Attorney(s)-in-fact, each in their separate capacity if more than one is named above, with full power and authority hereby conferred in its name, place and stead, to execute, acknowledge and deliver **any and all bonds, recognizances, undertakings or other instruments or contracts of suretyship to include riders, amendments, and consents of surety, providing the bond penalty does not exceed** *****Three Million***** Dollars (***3,000,000.00***). This Power of Attorney shall expire without further action on April 23rd, 2022. This Power of Attorney is granted under and by authority of the following resolutions adopted by the Boards of Directors of the Companies:

Be it Resolved, that the President, any Vice-President, any Assistant Vice-President, any Secretary or any Assistant Secretary shall be and is hereby vested with full power and authority to appoint any one or more suitable persons as Attorney(s)-in-Fact to represent and act for and on behalf of the Company subject to the following provisions:

Attorney-in-Fact may be given full power and authority for and in the name of and on behalf of the Company, to execute, acknowledge and deliver, any and all bonds, recognizances, contracts, agreements or indemnity and other conditional or obligatory undertakings, including any and all consents for the release of retained percentages and/or final estimates on engineering and construction contracts, and any and all notices and documents canceling or terminating the Company's liability thereunder, and any such instruments so executed by any such Attorney-in-Fact shall be binding upon the Company as if signed by the President and sealed and effected by the Corporate Secretary.

Be it Resolved, that the signature of any authorized officer and seal of the Company heretofore or hereafter affixed to any power of attorney or any certificate relating thereto by facsimile, and any power of attorney or certificate bearing facsimile signature or facsimile seal shall be valid and binding upon the Company with respect to any bond or undertaking to which it is attached.

IN WITNESS WHEREOF, The Companies have caused this instrument to be signed and their corporate seals to be hereto affixed, this 1st day of June, 2018.

AMERICAN CONTRACTORS INDEMNITY COMPANY TEXAS BONDING COMPANY
UNITED STATES SURETY COMPANY U.S. SPECIALTY INSURANCE COMPANY

State of California

County of Los Angeles



By:


Daniel P. Aguilar, Vice President

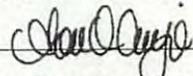
A Notary Public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document

On this 1st day of June, 2018, before me, Sonia O. Carrejo, a notary public, personally appeared Daniel P. Aguilar, Vice President of American Contractors Indemnity Company, Texas Bonding Company, United States Surety Company and U.S. Specialty Insurance Company who proved to me on the basis of satisfactory evidence to be the person whose name is subscribed to the within instrument and acknowledged to me that he executed the same in his authorized capacity, and that by his signature on the instrument the person, or the entity upon behalf of which the person acted, executed the instrument.

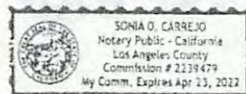
I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature



(seal)



I, Kio Lo, Assistant Secretary of American Contractors Indemnity Company, Texas Bonding Company, United States Surety Company and U.S. Specialty Insurance Company, do hereby certify that the above and foregoing is a true and correct copy of a Power of Attorney, executed by said Companies, which is still in full force and effect; furthermore, the resolutions of the Boards of Directors, set out in the Power of Attorney are in full force and effect.

In Witness Whereof, I have hereunto set my hand and affixed the seals of said Companies at Los Angeles, California this 19th day of October, 2021.

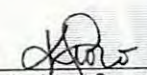
Corporate Seals

Bond No.

B013758

Agency No. 8353




Kio Lo, Assistant Secretary

HCCSMANPOA05/2019

visit tmhcc.com/surety for more information

**AUTHORIZATION TO PURCHASE AND TRANSPORT OIL FROM LEASE - FORM 8**

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

Received**APR 13 2021**

Well File No. 20749
NDIC CTB No. 120749

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

ND Oil & Gas Division

Well Name and Number MARLENE STEFFAN 1-5-8H-141-97	Qtr-Qtr SWSE	Section 32	Township 142 N	Range 97 W	County DUNN
Operator ENERPLUS RESOURCES (USA) CORP	Telephone Number (720) 279-5500		Field ST ANTHONY		
Address 950 17TH STREET, SUITE 2200	City DENVER		State CO	Zip Code 80202	

Name of First Purchaser CONCORD ENERGY LLC	Telephone Number (303) 468-1900	% Purchased 100	Date Effective March 10, 2021	
Principal Place of Business 1401 17TH STR SUITE 1500	City DENVER	State CO	Zip Code 80016	
Field Address 3804 17TH Ave NE	City WATFORD CITY	State ND	Zip Code 58854	
Name of Transporter BIG LEASE TRUCKING, LLC	Telephone Number (701) 764-7212	% Transported 100	Date Effective March 10, 2021	
Address 2036 ROUGH STOCK ROAD	City KILLDDER	State ND	Zip Code 58640	

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

Other First Purchasers Purchasing From This Lease	% Purchased	Date Effective
Other First Purchasers Purchasing From This Lease	% Purchased	Date Effective
Other Transporters Transporting From This Lease	% Transported	Date Effective
Other Transporters Transporting From This Lease	% Transported	Date Effective
Comments		

I hereby swear or affirm that the information provided is true, complete and correct as determined from all available records.			Date March 26, 2021
Signature <i>Jamie Krogh</i>	Printed Name JAMIE KROGH	Title OPERATIONS TECHNICIAN	
Above Signature Witnessed By <i>Kim Antle</i>	Witness Printed Name KIM ANTLE	Witness Title OPERATIONS TECHNICIAN	

FOR STATE USE ONLY

Date Approved AUG 05 2021
By <i>Melissa Herz</i>
Title Oil & Gas Production Analyst



NOTICE OF TRANSFER OF OIL AND GAS WELLS - FORM
INDUSTRIAL COMMISSION OF NORTH DAKOTA
OIL AND GAS DIVISION
600 EAST BOULEVARD DEPT 405
BISMARCK, ND 58505-0840
SFN 5762 (03-2000)



FOR STATE USE ONLY
NDIC Bond Number
700291

PLEASE READ INSTRUCTIONS BEFORE FILLING OUT FORM. PLEASE SUBMIT THE ORIGINAL AND SIX COPIES.
THIS NOTICE ALONG WITH A FEE OF \$25.00 PER WELL SHALL BE FILED AT LEAST THIRTY DAYS BEFORE THE CLOSING DATE OF TRANSFER.

TRANSFERRING OPERATOR

Name of Operator Representative Nathan Fisher			
Operator Transferring Oil and/or Gas Wells Bruin E&P Operating, LLC			Telephone Number (720) 279-5500
Address 602 Sawyer Street #710	City Houston	State TX	Zip Code 77007
I, the above named representative, acknowledge the transfer of the oil and/or gas wells named below for the purpose of ownership and/or operation to the company named below.			
Signature [Signature]	Title (Must be an officer or power of attorney must be attached) VP-US BUSINESS UNIT		Date 6/21/21

Well File Number	Requested Official Well Name and Number	Location (Qtr-Qtr, S-T-R)	Assignment Date
	See attached well list.		3/16/21

RECEIVING OPERATOR

Name of Operator Representative Nathan Fisher			
Operator Receiving Oil and/or Gas Wells Enerplus Resources (USA) Corporation			Telephone Number (720) 279-5500
Address 950 17th Street Suite 2200	City Denver	State CO	Zip Code 80202
I, the above named representative, have read the foregoing statement and accept such transfer, also the responsibility of ownership and/or operation of said well or wells, under the said company bond, said bond being tendered to or on file with the Industrial Commission of North Dakota.			
Signature [Signature]	Title (Must be an officer or power of attorney must be attached) VP-US BUSINESS UNIT		Date 6/21/21

SURETY COMPANY

Surety Liberty Mutual Surety		Telephone Number (469) 997-6767		Amount of Bond \$ \$100,000
Address 7900 Windrose Avenue	City Plano	State TX	Zip Code 75024	Bond Number 022225137
The above named SURETY agrees that such bond shall extend to compliance with Chapter 38-08 of North Dakota Century Code and amendments and the rules and regulations of the Industrial Commission of North Dakota prescribed to govern the production of oil and gas on government and private lands within the State of North Dakota, in relation to the above stated transfer; it being further agreed and understood that the bond sum or amount is not to be considered increased because of such extension.				
Signature [Signature]		Title (Must be an officer or power of attorney must be attached) Attorney-In-Fact		Date June 18, 2021
Printed Name Jennifer Winters				

FOR STATE USE ONLY

Date Approved August 3, 2021
By Bruce E. Hahn
Title Assistant Director



This Power of Attorney limits the acts of those named herein, and they have no authority to bind the Company except in the manner and to the extent herein stated.

Liberty Mutual Insurance Company
The Ohio Casualty Insurance Company
West American Insurance Company

Certificate No: **8197876**

POWER OF ATTORNEY

KNOWN ALL PERSONS BY THESE PRESENTS: That The Ohio Casualty Insurance Company is a corporation duly organized under the laws of the State of New Hampshire, that Liberty Mutual Insurance Company is a corporation duly organized under the laws of the State of Massachusetts, and West American Insurance Company is a corporation duly organized under the laws of the State of Indiana (herein collectively called the "Companies"), pursuant to and by authority herein set forth, does hereby name, constitute and appoint, Harold D. Binggeli, Cara D. Hancock, Jennifer Winters

all of the city of Lubbock state of TX each individually if there be more than one named, its true and lawful attorney-in-fact to make, execute, seal, acknowledge and deliver, for and on its behalf as surety and as its act and deed, any and all undertakings, bonds, recognizances and other surety obligations, in pursuance of these presents and shall be as binding upon the Companies as if they have been duly signed by the president and attested by the secretary of the Companies in their own proper persons.

IN WITNESS WHEREOF, this Power of Attorney has been subscribed by an authorized officer or official of the Companies and the corporate seals of the Companies have been affixed thereto this 1st day of November, 2018.



Liberty Mutual Insurance Company
The Ohio Casualty Insurance Company
West American Insurance Company

By:

David M. Carey
David M. Carey, Assistant Secretary

State of PENNSYLVANIA ss
County of MONTGOMERY

On this 1st day of November, 2018 before me personally appeared David M. Carey, who acknowledged himself to be the Assistant Secretary of Liberty Mutual Insurance Company, The Ohio Casualty Company, and West American Insurance Company, and that he, as such, being authorized so to do, execute the foregoing instrument for the purposes therein contained by signing on behalf of the corporations by himself as a duly authorized officer.

IN WITNESS WHEREOF, I have hereunto subscribed my name and affixed my notarial seal at King of Prussia, Pennsylvania, on the day and year first above written.



COMMONWEALTH OF PENNSYLVANIA
Notarial Seal
Teresa Pastella, Notary Public
Upper Merion Twp., Montgomery County
My Commission Expires March 28, 2021
Member, Pennsylvania Association of Notaries

By:

Teresa Pastella
Teresa Pastella, Notary Public

This Power of Attorney is made and executed pursuant to and by authority of the following By-laws and Authorizations of The Ohio Casualty Insurance Company, Liberty Mutual Insurance Company, and West American Insurance Company which resolutions are now in full force and effect reading as follows:

ARTICLE IV – OFFICERS: Section 12. Power of Attorney.

Any officer or other official of the Corporation authorized for that purpose in writing by the Chairman or the President, and subject to such limitation as the Chairman or the President may prescribe, shall appoint such attorneys-in-fact, as may be necessary to act in behalf of the Corporation to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations. Such attorneys-in-fact, subject to the limitations set forth in their respective powers of attorney, shall have full power to bind the Corporation by their signature and execution of any such instruments and to attach thereto the seal of the Corporation. When so executed, such instruments shall be as binding as if signed by the President and attested to by the Secretary. Any power or authority granted to any representative or attorney-in-fact under the provisions of this article may be revoked at any time by the Board, the Chairman, the President or by the officer or officers granting such power or authority.

ARTICLE XIII – Execution of Contracts: Section 5. Surety Bonds and Undertakings.

Any officer of the Company authorized for that purpose in writing by the chairman or the president, and subject to such limitations as the chairman or the president may prescribe, shall appoint such attorneys-in-fact, as may be necessary to act in behalf of the Company to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations. Such attorneys-in-fact subject to the limitations set forth in their respective powers of attorney, shall have full power to bind the Company by their signature and execution of any such instruments and to attach thereto the seal of the Company. When so executed such instruments shall be as binding as if signed by the president and attested by the secretary.

Certificate of Designation – The President of the Company, acting pursuant to the Bylaws of the Company, authorizes David M. Carey, Assistant Secretary to appoint such attorneys-in-fact as may be necessary to act on behalf of the Company to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations.

Authorization – By unanimous consent of the Company's Board of Directors, the Company consents that facsimile or mechanically reproduced signature of any assistant secretary of the Company, wherever appearing upon a certified copy of any power of attorney issued by the Company in connection with surety bonds, shall be valid and binding upon the Company with the same force and effect as though manually affixed.

I, Renee C. Llewellyn, the undersigned, Assistant Secretary, The Ohio Casualty Insurance Company, Liberty Mutual Insurance Company, and West American Insurance Company do hereby certify that the original power of attorney of which the foregoing is a full, true and correct copy of the Power of Attorney executed by said Companies, is in full force and effect and has not been revoked.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed the seals of said Companies this 18th day of June, 2021



By:

Renee C. Llewellyn
Renee C. Llewellyn, Assistant Secretary

Not valid for mortgage, note, loan, letter of credit, currency rate, interest rate or residual value guarantees.

To confirm the validity of this Power of Attorney call 1-610-832-8240 between 9:00 am and 4:30 pm EST on any business day.

File No	CTB No	Location	Well Name
1871		NENE 31-163-78	H. AND H. NORDMARK 1
16178	116178	NWNW 4-141-96	DVORAK 11-4H
16192	116192	SESE 32-142-97	PAVLICEK 44-32H
16282		SWSE 18-161-78	V&F JOHNSON-FCB 1-18
17234	117234	SESW 10-142-95	DVORAK 10-1H
17569		SWNW 3-163-78	KJELSHUS 5-3
17808	117808	SESW 14-141-96	SADOWSKY 24-14H
17961	117961	NWNW 27-141-95	KADRMAS 11-27H
17984	117984	LOT3 4-141-95	SICKLER STATE 21-4H
18056	118056	SWSE 12-141-97	SADOWSKY 34-12H
18094	218094	SESE 17-148-94	FORT BERTHOLD 148-94-17D-08-1H
18126	118126	SESW 17-152-93	FORT BERTHOLD 152-93-17C-08-1H
18206	218206	NWNE 2-147-94	FORT BERTHOLD 147-94-2A-11-1H
18272	118272	NWNE 10-141-96	JAEGER 1-10-15H-141-96
18313	218313	SWSE 35-148-94	FORT BERTHOLD 148-94-35D-26-1H
18332	118332	NWNE 25-148-94	FORT BERTHOLD 148-94-25A-36-1H
18335	118335	NWNE 22-148-94	FORT BERTHOLD 148-94-22A-27-1H
18341	218341	NWNE 1-147-94	FORT BERTHOLD 147-94-1A-12-1H
18367	118367	SESE 9-148-94	FORT BERTHOLD 148-94-9D-04-1H
18402	118402	SESE 22-152-94	FORT BERTHOLD 152-94-22D-15-1H
18426	218426	SWSW 14-152-94	FORT BERTHOLD 152-94-14C-11-1H
18446	218446	NENW 18-152-93	FORT BERTHOLD 152-93-18B-19-1H
18458	218458	NENE 3-147-94	FORT BERTHOLD 147-94-3A-10-1H
19048	119048	SESE 11-156-101	BORRUD 156-101-11D-2-1H
19088	119088	NENW 18-141-95	WOLBERG 21-18H
19103	219103	NENE 28-157-100	NJOS 157-100-28A-33-1H
19169	119169	NWNW 11-157-103	CARLSON 1-11H
19252	119252	SESE 24-157-102	ANDERSON 1-24-13H
19306	119306	NWNW 28-157-102	SIIRTOLA 1-28-33H
19438	119438	SESW 21-142-97	FISHER STATE 1-21-16H-142-97

19494	119494 NENW 36-142-96	ALFRED SADOWSKY 1-36-1H-141-96
19547	119547 SWSW 21-157-100	STATE 157-100-21C-16-1H
19598	119598 NENE 26-158-99	OPSAL 158-99-26A-35-1H
19646	119646 NWNW 2-157-100	STORHAUG 157-100-2A-11-1H
19670	119670 NENE 26-157-101	MONSON TRUST 157-101-26A-35-1H
19777	119777 NWNW 13-157-101	ERIKSON 157-101-13B-24-1H
19950	119950 SESE 31-157-100	GREV 157-100-31D-30-1H
19976	219976 SWSW 20-148-94	FORT BERTHOLD 148-94-29B-32-1H
20024	120024 NWNW 16-142-95	NOVASIO STATE 1-16-21H-142-95
20063	120063 SWSW 32-157-100	STATE 157-100-32C-29-1H
20065	120065 NWNW 14-157-101	ROSSLAND 157-101-14B-23-1H
20086	220086 LOT 4 3-150-94	FORT BERTHOLD 150-94-3B-10-1H
20088	220088 LOT 4 3-150-94	FORT BERTHOLD 151-94-34C-27-1H
20092	120092 NENW 17-141-95	GORDON PAVLICEK 1-17-20H-141-95
20104	120104 NWNW 8-141-96	ELSIE DVORAK 1-8-17H-141-96
20172	220172 SESE 23-148-95	FORT BERTHOLD 148-95-23D-14-1H
20173	220173 SESE 23-148-95	FORT BERTHOLD 148-95-26A-35-1H
20218	120218 NWNW 9-141-96	STATE DVORAK 1-9-16H-141-96
20252	220252 SESE 19-148-94	FORT BERTHOLD 148-94-19D-18-1H
20253	220253 SESE 19-148-94	FORT BERTHOLD 148-94-30A-31-1H
20269	120269 SWSW 17-152-93	FORT BERTHOLD 152-93-17C-08-2H
20328	220328 NENW 26-151-94	FORT BERTHOLD 151-94-26B-35-1H
20411	120411 SWSW 21-142-94	STATE JAEGER 1-21-16H-142-94
20416	120416 SESW 6-141-96	DVORAK TRUST 1-6-31H-142-96
20425	120425 NWSW 35-142-97	STATE POLENSKY 1-35-36H-142-97
20441	120441 SESW 34-142-97	STATE MARSH 1-34-27H-142-97
20458	220458 SESW 17-152-93	FORT BERTHOLD 152-93-17C-08-3H

20534	120534 LOT4 5-157-101	POECKES 1-32-29H
20535	120535 LOT4 5-157-101	PETERSON TRUST 1-5-8H
20552	120552 SWSW 21-158-103	MULLER 1-21-16H
20553	120553 NENE 25-157-103	RASMUSSEN 1-25-36H
20567	120567 SESE 22-152-94	FORT BERTHOLD 152-94-22D-15-2H
20580	120580 NENE 15-142-95	TERRY DVORAK 1-15-22H-142-95
20614	120614 NWNW 17-157-100	WHITE 157-100-17B-20-1H
20659	120659 SWSE 17-141-97	KUDRNA 1-17
20707	120707 LOT2 1-157-103	PASTERNAK 1-1-12H
20723	120723 SWSE 32-158-99	HOKANSON 158-99-32D-29-1H
20749	120749 SWSE 32-142-97	MARLENE STEFFAN 1-5-8H-141-97
20750	120750 SWSE 12-142-95	KATIE HEISER 1-12-1H-142-95
20765	120765 SWSE 11-142-95	GEORGE MILLER 1-11-2H-142-95
20794	120794 NWNW 25-158-99	STATE 158-99-25A-36-1H
20825	120825 SESE 8-157-100	WILLIAMS AND LARSON TRUST 157-100-8D-5-1H
20844	220844 SESW 21-157-102	RASMUSSEN 1-21-16H
20866	120866 SESE 23-148-95	FORT BERTHOLD 148-95-23D-14-2H
20871	120871 SESE 9-148-94	FORT BERTHOLD 148-94-9D-04-2H
20879	120879 NENE 1-147-94	FORT BERTHOLD 147-94-1A-12-2H
20880	220880 NENE 1-147-94	FORT BERTHOLD 148-94-36D-25-2H
20918	120918 SWSW 24-148-95	FORT BERTHOLD 148-95-24C-13-1H
20919	220919 SWSW 24-148-95	FORT BERTHOLD 148-95-25B-36-1H
20953	120953 LOT2 4-157-100	JOHNSON FAMILY TRUST 157-100-4A-9-1H
20989	120989 NWNW 18-157-100	PASTERNAK TRUST 157-100-18A-19-1H
20990	120990 NENE 18-157-100	BERG 157-100-7D-6-1H
20992	120992 NENW 25-157-101	SYLTE MINERAL TRUST 157-101-25B-36-1H
21040	121040 SESE 34-158-99	HELSTAD 158-99-34D-27-1H
21066	218094 SESE 17-148-94	FORT BERTHOLD 148-94-17D-08-2H

21079	220252 SESE 19-148-94	FORT BERTHOLD 148-94-19D-18-2H
21080	220253 SESE 19-148-94	FORT BERTHOLD 148-94-30A-31-2H
21083	121083 NENW 28-158-102	DORIS 1-28-33H
21161	NESE 2-157-100	OSTAD 157-100-2D-1-1
21185	121185 SWSW 36-158-103	STATE 1-36-25H
21207	121207 NENW 14-157-101	STROMME FAMILY TRUST 157-101-11C-2-1H
21238	121238 NENW 28-158-99	HELSTAD 158-99-28B-33-1H
21293	221293 SESE 19-142-97	MAURICE HECKER 1-19-18H-142-97
21420	121420 LOT2 1-157-99	HOKANSON 157-99-1A-12-1H
21550	121550 NWNE 4-157-103	SEVEN 1-4-9H
21578	121578 SWSE 9-156-101	BERGER 156-101-9-4-1H
21606	121606 NENW 28-141-95	PRIVRATSKY 1-28-33H-141-95
21610	121610 LOT2 5-157-103	ARNSON 1-5-8H
21642	121642 SESW 20-142-97	COYOTE CREEK 1-20-17H-142-97
21652	218446 NENW 18-152-93	FORT BERTHOLD 152-93-18B-19-2H
21653	218446 NENW 18-152-93	FORT BERTHOLD 152-93-18B-19-3H
21669	121669 SESW 36-142-95	STATE JABLONSKY 1-1-12H-141-95
21674	121674 NWNE 29-142-94	FEDERAL ANNIE OAKLEY 1-20-17H-142-94
21703	121703 NENW 13-157-101	MILLER 157-101-12C-1-1H
21719	121719 LOT2 1-157-102	HOUGHT 1-1-12H
21800	221800 SESE 8-152-93	FORT BERTHOLD 152-93-9C-10-1H
21801	221800 SWSW 9-152-93	FORT BERTHOLD 152-93-9C-10-2H
21802	221800 SWSW 9-152-93	FORT BERTHOLD 152-93-9C-10-3H
21803	221800 SWSW 9-152-93	FORT BERTHOLD 152-93-9C-10-4H
21805	221800 SWSW 9-152-93	FORT BERTHOLD 152-93-9C-10-5H
21807	221800 SWSW 9-152-93	FORT BERTHOLD 152-93-9C-10-6H
21844	121844 SESW 32-142-96	KEARY KADRMAS 1-32-29H-142-96
21870	121870 NENW 6-156-101	AGRIBANK 157-101-34C-27-1H
21900	218206 NENE 2-147-94	FORT BERTHOLD 147-94-2A-11-2H
21901	218313 SESE 35-148-94	FORT BERTHOLD 148-94-35D-26-2H
21913	121913 NWNE 20-141-96	BILL CODY 1-20-29H-141-96

21939	121939 NWNW 5-157-102	PASTERNAK 1-32-29H
21940	121940 NWNW 5-157-102	PASTERNAK 1-5-8H
21963	121963 SESE 23-148-95	FORT BERTHOLD 148-95-26A-35-2H
22001	122001 NENW 4-157-102	PASTERNAK 1-4-9H
22054	122054 NENW 29-157-102	BOYDS 1-29-32H
22090	220458 SESW 17-152-93	FORT BERTHOLD 152-93-17C-08-4H
22128	122128 NENW 30-157-102	A & B 1-30-31H
22133	122133 SESE 12-142-95	MONGOOSE 1-13-24H-142-95
22150	122150 SWSE 12-141-97	RICHARD JABLONSKY 1-13-24H-141-97
22172	122172 SWSE 19-142-95	HAVELKA 1-19-18H-142-95
22234	122234 SWSE 19-142-95	STATE LITTLE MISSOURI 1-30-31H-142-95
22300	NWNW 27-148-95	FB BELFORD 148-95-22D-15-2T
22301	NWNW 27-148-95	FB BELFORD 148-95-22D-15-3B
22309	122309 SESW 31-158-102	THOME 1-6-7H
22310	122310 SESW 31-158-102	THOME 1-31-30H
22312	222312 NWNW 28-148-94	FORT BERTHOLD 148-94-28A-33-1H
22313	222312 NWNW 28-148-94	FORT BERTHOLD 148-94-28A-33-2H
22351	122351 NWNW 28-142-97	LOUIE PAVLICEK 1-28-33H-142-97
22352	122352 NWNW 28-142-97	STATE FISHER 2-21-16H-142-97
22369	122369 SESW 36-142-95	STATE JABLONSKY B 1-36-25H-142-95
22441	122441 SWSW 34-142-96	BINSTOCK 1-34-27H-142-96
22444	122444 SWSE 35-142-95	EASTON 1-35-26H-142-95
22445	122445 SWSW 33-142-96	HATTIE DVORAK 1-33-28H-142-96
22447	122447 NENW 26-157-102	J. RASMUSSEN 1-26-35H
22448	122448 NENW 26-157-102	C. RASMUSSEN 1-23-14H
22456	122456 LOT2 1-157-100	HOFF 157-100-1A-12-1H
22469	122469 SESW 31-158-101	HOUGHT 1-6-7H
22470	122470 SESW 31-158-101	HOUGHT 1-31-30H
22495	222495 LOT3 1-156-101	BORRUD 156-101-1-12-1H
22503	220919 SWSW 24-148-95	FORT BERTHOLD 148-95-25B-36-2H
22506	222506 SESW 22-157-101	ROSSLAND 157-101-22C-15-1H

22518	122518 NWNE 27-157-102	QUARNE 1-27-34H
22545	122545 SWSE 9-158-102	J HAUGEN 1-9-4H
22560	222560 SENE 21-148-94	FORT BERTHOLD 148-94-21A-20-1H
22561	222560 SENE 21-148-94	FORT BERTHOLD 148-94-21A-20-2H
22562	222560 SENE 21-148-94	FORT BERTHOLD 148-94-21A-20-3H
22589	122589 LOT3 3-157-101	KING 157-101-3B-10-1H
22672	122672 NWNE 18-158-101	PEDERSON 1-18-19H
22707	220328 NWNW 26-151-94	FORT BERTHOLD 151-94-26B-35-3H
22708	220328 NWNW 26-151-94	FORT BERTHOLD 151-94-26B-35-2H
22822	122822 SWSE 20-157-101	BERG 1-29-32H
22823	122823 SWSE 20-157-101	BERG 1-20-17H
22826	122826 LOT1 2-157-99	HELSTAD 157-99-2A-11-1H
22878	122878 NENW 22-148-94	FORT BERTHOLD 148-94-22B-27-5H
22881	122881 NWNE 29-142-94	STATE FRANK BUTLER 1-29-32H-142-94
22979	222979 SESW 9-148-94	FORT BERTHOLD 148-94-9C-04-5H
22980	222979 SESW 9-148-94	FORT BERTHOLD 148-94-9C-04-4H
22981	222979 SESW 9-148-94	FORT BERTHOLD 148-94-9C-04-3H
22983	219976 SWSW 20-148-94	FORT BERTHOLD 148-94-29B-32-2H
22984	122984 SWSE 20-142-95	SCHAFNER 1-29-32H-142-95
22985	122985 SWSE 20-142-95	STATE LITTLE KNIFE 1-20-17H-142-95
23088	123088 SESW 23-142-98	KUNTZ 1-23-14H-142-98
23120	123120 NWNE 27-157-102	HOUGHT F.T. 1-22-15H
23123	123123 SWSE 19-148-94	FORT BERTHOLD 148-94-19D-18-3H
23124	123124 SWSE 19-148-94	FORT BERTHOLD 148-94-30A-31-3H
23223	223223 NENE 22-148-94	FORT BERTHOLD 148-94-22A-27-2H
23252	123252 SWSE 34-158-102	ANDRE 1-34-27H
23253	123253 SWSE 34-158-102	PASTERNAK 1-3-10H

23258	123258 SESE 34-148-94	FORT BERTHOLD 147-94-3A-10-2H
23353	123353 NENW 27-142-95	FRANK ANDERS 1-27-34H-142-95
23382	123382 NWNW 1-147-94	FORT BERTHOLD 147-94-1B-12-3H
23383	123383 NWNW 1-147-94	FORT BERTHOLD 148-94-36C-25-3H
23384	123384 SESW 13-141-96	JOSEPH CARTER 1-13-12H-141-96
23505	223507 SESE 17-152-93	FORT BERTHOLD 152-93-17D-08-7H
23506	223507 SESE 17-152-93	FORT BERTHOLD 152-93-17D-08-6H
23507	223507 SESE 17-152-93	FORT BERTHOLD 152-93-17D-08-5H
23550	218426 SWSW 14-152-94	FORT BERTHOLD 152-94-14C-11-2H
23554	223554 SESE 14-152-94	FORT BERTHOLD 152-94-14D-11-4H
23555	SESE 14-152-94	FORT BERTHOLD 152-94-14D-11-3H
23596	223596 LOT 3 2-157-102	PASTERNAK FEDERAL 1-2-11H
23597	123597 NENW 30-157-101	BERG 1-30-31H
23621	123621 NENW 30-157-101	BERG 1-19-18H
23676	123676 NWNE 4-142-94	CHARLES DAVIS 1-4-9H-142-94
23685	123685 SESW 7-142-94	MEDUNA TRUST 1-7-6H-142-94
23706	123706 LOT3 2-157-102	MILLER 1-35-26H
23722	123722 LOT3 1-157-102	HOUGHT 2-1-12H
23723	123723 LOT3 1-157-102	H STATE 1-36-25H
23844	123844 SWSW 36-141-97	NELS WOLD 1-36-25H-141-97
23845	123845 NENW 24-142-96	RIDL 1-24-25H-142-96
23928	123928 SESE 30-141-96	HENRY GURKE 1-30-19H-141-96
23932	123932 SWSE 35-141-97	LOREN HAGEN 1-35-26H-141-97
24108	124108 NWNE 14-157-103	G LARSEN 1-14-23H
24150	224150 SWSW 27-148-94	FORT BERTHOLD 148-94-27C-22-3H
24210	124210 SWSW 21-141-96	WOODROW KEEBLE 1-21-22H-141-96
24220	124220 NENW 26-149-98	BERG TRUST FEDERAL 1-26-35H
24231	124231 NWNE 13-158-102	GLIMM 1-13-24H
24248	NENW 14-158-102	OYEN 1-11-2H
24249	124249 NENW 14-158-102	POECKES 1-14-23H

25207	225207 NENW 27-148-95	FORT BERTHOLD 148-95-27B-34-4H
25208	225208 NENW 27-148-95	FORT BERTHOLD 148-95-22C-15-4H
25209	225207 SESW 22-148-95	FORT BERTHOLD 148-95-27B-34-5H
25210	225208 SESW 22-148-95	FORT BERTHOLD 148-95-22C-15-5H
25370	218905 NWNW 13-152-94	FORT BERTHOLD 152-94-13B-24-2H
25399	225399 NENE 13-152-94	FORT BERTHOLD 152-94-13A-24-4H
25400	225399 NENE 13-152-94	FORT BERTHOLD 152-94-13A-24-3H
25443	NWNW 25-157-102	ANN H. THOME 3-25-36H
25444	NWNW 25-157-102	ANN H. THOME 4-25-36H
25445	NENW 25-157-102	ANN H. THOME 5-25-36H
25494	224731 NWNW 15-152-94	FORT BERTHOLD 152-94-15B-22-4H
25499	125499 SWSE 20-157-100	MOLINE 157-100-20D-17-2H
25502	224417 SESW 17-148-94	FORT BERTHOLD 148-94-17C-8-5H
25524	225524 SESW 2-152-94	FORT BERTHOLD 152-94-11B-14-5H
25525	225524 SESW 2-152-94	FORT BERTHOLD 152-94-11B-14-6H
25526	225524 SESW 2-152-94	FORT BERTHOLD 152-94-11B-14-7H
25534	125534 SWSW 33-148-94	FORT BERTHOLD 148-94-33C-28-3H
25556	NWNE 29-148-94	FORT BERTHOLD 148-94-29A-32-8TFH
25557	NWNE 29-148-94	FORT BERTHOLD 148-94-29A-32-9TFH
25570	222226 SESE 24-157-102	JOHNSON 7-25-36H
25596	225597 SESW 35-148-94	FORT BERTHOLD 147-94-2B-11-5H
25597	225597 SESW 35-148-94	FORT BERTHOLD 147-94-2B-11-4H
25598	225597 SESW 35-148-94	FORT BERTHOLD 147-94-2B-11-3H
25793	219103 NWNW 28-157-100	NJOS 157-100-28B-33-2H

25800	NENW 3-147-94	FORT BERTHOLD 147-94-3B-10-8TFH
25801	224270 NENW 3-147-94	FORT BERTHOLD 147-94-3B-10-7H
25988	225988 SWSW 20-148-94	FORT BERTHOLD 148-94-20C-21-5H
25989	225988 SWSW 20-148-94	FORT BERTHOLD 148-94-20C-21-4H
25992	223596 LOT1 2-157-102	PASTERNAK FEDERAL 2-2-11H
26084	220844 SWSE 21-157-102	QUARNE 2-21-16H

File No	CTB No	Location	Well Name
26116	126116	SESW 19-157-100	GREV 157-100-30B-31-3H
26117		LOT4 19-157-100	PASTERNAK TRUST 157-100-19C-18-3H
26118	126118	LOT4 19-157-100	GREV 157-100-30B-31-2H
26119	126119	LOT4 19-157-100	PASTERNAK TRUST 157-100-19C-18-2H
26209		SESE 31-158-102	CHRISTINE JOE 2-31-30H
26210	126210	SWSE 20-157-100	STATE 157-100-29A-32-3H
26211	126211	SWSE 20-157-100	MOLINE 157-100-20D-17-3H
26279	226279	SESW 36-148-94	FORT BERTHOLD 148-94-36C-25-4H
26280	226280	SESW 36-148-94	FORT BERTHOLD 147-94-1B-12-4H
26281	226279	SESW 36-148-94	FORT BERTHOLD 148-94-36C-25-5H
26282	226280	SESW 36-148-94	FORT BERTHOLD 147-94-1B-12-5H
26293	226293	SESW 35-148-94	FORT BERTHOLD 148-94-35C-26-5H
26294	226293	SESW 35-148-94	FORT BERTHOLD 148-94-35C-26-4H
26295	226293	SESW 35-148-94	FORT BERTHOLD 148-94-35C-26-3H
26322	225207	NENW 27-148-95	FORT BERTHOLD 148-95-27B-34-8H
26323	225208	NENW 27-148-95	FORT BERTHOLD 148-95-22C-15-9H
26341	226341	SESE 12-157-101	MILLER 157-101-12D-1-3H
26342	226341	SESE 12-157-101	MILLER 157-101-12D-1-2H
26366	126366	SESW 32-142-96	KEARY KADRMAS 2-32-29H-142-96
26414		NENE 25-157-101	BERG 157-101-24D-13-2H
26415		NENE 25-157-101	WM POLAR 157-101-25A-36-2B
26417		NENE 25-157-101	WM POLAR 157-101-25A-36-4B
26671		NENW 3-147-94	FORT BERTHOLD 147-94-3B-10-9TFH
26796	226796	SWSE 24-152-94	FORT BERTHOLD 152-94-24D-13-7H
26797	226796	SWSE 24-152-94	FORT BERTHOLD 152-94-24D-13-6H
26798	226796	SWSE 24-152-94	FORT BERTHOLD 152-94-24D-13-5H
26815	226815	LOT4 3-157-99	WM HELSTAD 158-99-34C-27-2B
26816	226815	LOT4 3-157-99	WM JOHNSON 157-99-3B-10-2B
26817	226815	LOT3 3-157-99	WM HELSTAD 158-99-34C-27-3B
26818	226815	LOT4 3-157-99	WM JOHNSON 157-99-3B-10-3B
26824		NENE 25-157-101	WM POLAR 157-101-25B-36-6B
26865	226865	SWSW 33-148-94	FORT BERTHOLD 148-94-33C-28-8H
26866	226865	SWSW 33-148-94	FORT BERTHOLD 148-94-33C-28-9H
26867	226865	SWSW 33-148-94	FORT BERTHOLD 148-94-33C-28-10H

26906	226906	SESW 19-152-93	FORT BERTHOLD 152-93-19D-18-7H
26907	226906	SESW 19-152-93	FORT BERTHOLD 152-93-19D-18-6H
26913		SESE 19-152-93	FORT BERTHOLD 152-93-19D-18-5H
26914	226906	SESE 19-152-93	FORT BERTHOLD 152-93-19D-18-4H
26917		SWSE 24-157-103	JANE NELSON 34-24H
27000	219038	NWNE 25-157-100	NELSON 157-100-25A-36-2H
27001	219038	NWNE 25-157-100	NELSON 157-100-25A-36-3H
27002	219038	NWNE 25-157-100	NELSON 157-100-25A-36-4H
27045	225988	SWSW 20-148-94	FORT BERTHOLD 148-94-20C-21-6H
27102		SWSW 27-148-94	FORT BERTHOLD 148-94-27C-22-9H
27103	224150	SWSW 27-148-94	FORT BERTHOLD 148-94-27C-22-8H
27105	224150	SWSW 27-148-94	FORT BERTHOLD 148-94-27C-22-7H
27106	224150	SWSW 27-148-94	FORT BERTHOLD 148-94-27C-22-6H
27107	224150	SWSW 27-148-94	FORT BERTHOLD 148-94-27C-22-4H
27125	220172	SESE 23-148-95	FORT BERTHOLD 148-95-23D-14-6H
27126	220173	SESE 23-148-95	FORT BERTHOLD 148-95-26A-35-10H
27127	220172	SESE 23-148-95	FORT BERTHOLD 148-95-23D-14-7H
27277	227277	SESW 19-148-94	FORT BERTHOLD 148-94-19C-18-4H
27278	227278	SESW 19-148-94	FORT BERTHOLD 148-94-30B-31-4H
27279	227277	SESW 19-148-94	FORT BERTHOLD 148-94-19C-18-5H
27280	227278	SESW 19-148-94	FORT BERTHOLD 148-94-30B-31-5H
27412	220919	SESW 24-148-95	FORT BERTHOLD 148-95-25B-36-7H
27414	220919	SWSW 24-148-95	FORT BERTHOLD 148-95-25B-36-6H
27415	220919	SWSW 24-148-95	FORT BERTHOLD 148-95-25B-36-5H
27416	220919	SWSW 24-148-95	FORT BERTHOLD 148-95-25B-36-4H
27417	220919	SWSW 24-148-95	FORT BERTHOLD 148-95-25B-36-3H
27431	227431	NENW 26-148-95	FORT BERTHOLD 148-95-23C-14-3H
27432	227431	NENW 26-148-95	FORT BERTHOLD 148-95-23C-14-8H
27433	227431	NENW 26-148-95	FORT BERTHOLD 148-95-23C-14-4H
27434	227431	NENW 26-148-95	FORT BERTHOLD 148-95-23C-14-9H
27435	227431	NENW 26-148-95	FORT BERTHOLD 148-95-23C-14-5H
27456	227456	NENW 26-148-95	FORT BERTHOLD 148-95-26B-35-3H
27457	227456	NENW 26-148-95	FORT BERTHOLD 148-95-26B-35-9H
27458	227456	NENW 26-148-95	FORT BERTHOLD 148-95-26B-35-4H
27459	227456	NENW 26-148-95	FORT BERTHOLD 148-95-26B-35-8H
27460	227456	NENW 26-148-95	FORT BERTHOLD 148-95-26B-35-5H

27543	127543	SESW 22-142-98	JOHN KINNE 2-27-34H-142-98
27646	220173	SESE 23-148-95	FORT BERTHOLD 148-95-26A-35-14H
27888	221293	SESE 19-142-97	MAURICE HECKER 2-19-18H-142-97
28280	224417	SESW 17-148-94	FORT BERTHOLD 148-94-17C-8-6H
28281	224417	SESW 17-148-94	FORT BERTHOLD 148-94-17C-8-7H
28296	226906	SESE 19-152-93	FORT BERTHOLD 152-93-19D-18-10H
28297	228297	SESE 19-152-93	FORT BERTHOLD 152-93-19D-18-11H
28298	228297	SESE 19-152-93	FORT BERTHOLD 152-93-19D-18-14H
28628	222312	NWNE 28-148-94	FORT BERTHOLD 148-94-28A-33-13H
28629	128629	NWNE 28-148-94	FORT BERTHOLD 148-94-28A-33-12H
29134	226279	SESW 36-148-94	FORT BERTHOLD 148-94-36C-25-6H
29135	226280	SESW 36-148-94	FORT BERTHOLD 147-94-1B-12-6H
29136	226280	SESW 36-148-94	FORT BERTHOLD 147-94-1B-12-7H
29238	225562	LOT3 2-156-101	BORRUD 156-101-2B-11-3H
29239	225562	LOT3 2-156-101	BORRUD 156-101-2B-11-4H
29240	225562	LOT3 2-156-101	BORRUD 156-101-2B-11-5H
29538		LOT3 1-156-101	BORRUD 156-101-1B-12-3H-P
29539	222495	LOT3 1-156-101	BORRUD 156-101-1B-12-2H
29571	224338	SESE 33-148-94	FORT BERTHOLD 148-94-33D-28-6H
29572	129572	SESE 33-148-94	FORT BERTHOLD 148-94-33D-28-7H
29787	222495	LOT3 1-156-101	BORRUD 156-101-1A-12-1TFH
29847	218458	NENE 3-147-94	FORT BERTHOLD 147-94-3A-10-6H
29848	218458	NENE 3-147-94	FORT BERTHOLD 147-94-3A-10-10H
29849	129849	NENE 3-147-94	FORT BERTHOLD 147-94-3A-10-12H
30241	230241	SESW 7-152-93	FORT BERTHOLD 152-93-7C-6-13H
30242	230241	SESW 7-152-93	FORT BERTHOLD 152-93-7C-6-12H
30243	230243	SESW 7-152-93	FORT BERTHOLD 152-93-7C-6-11H
30244	230243	SESW 7-152-93	FORT BERTHOLD 152-93-7C-6-10H
30245	230243	SESW 7-152-93	FORT BERTHOLD 152-93-7C-6-9H
30246	230243	SESW 7-152-93	FORT BERTHOLD 152-93-7C-6-8H
30247	230243	SESW 7-152-93	FORT BERTHOLD 152-93-7C-6-7H
30248	230243	SESW 7-152-93	FORT BERTHOLD 152-93-7C-6-6H
30268	218094	SESE 17-148-94	FORT BERTHOLD 148-94-17D-8-12H
30269	130269	SESE 17-148-94	FORT BERTHOLD 148-94-17D-8-13H
30541	230541	NENE 26-151-94	FORT BERTHOLD 151-94-26A-35-4H
30542	230541	NENE 26-151-94	FORT BERTHOLD 151-94-26A-35-5H
30543	230541	NENE 26-151-94	FORT BERTHOLD 151-94-26A-35-6H
30544	230541	NENE 26-151-94	FORT BERTHOLD 151-94-26A-35-7H
30545	230541	NENE 26-151-94	FORT BERTHOLD 151-94-26A-35-8H
30546	230541	NENE 26-151-94	FORT BERTHOLD 151-94-26A-35-9H

30555	230555 NWNW 13-148-95	FORT BERTHOLD 148-95-13B-24-2H
30556	230555 NWNW 13-148-95	FORT BERTHOLD 148-95-13B-24-10H
30558	230555 NENW 13-148-95	FORT BERTHOLD 148-95-13B-24-12H
30559	230555 NENW 13-148-95	FORT BERTHOLD 148-95-13B-24-13H
30564	227431 NENW 26-148-95	FORT BERTHOLD 148-95-23C-14-10H
30679	218341 NWNE 1-147-94	FORT BERTHOLD 147-94-1A-12-10H
30680	218341 NWNE 1-147-94	FORT BERTHOLD 147-94-1A-12-9H
30726	230726 NENE 26-149-98	BERG TRUST FEDERAL 149-98-26A-35-6H
30727	230726 NENE 26-149-98	BERG TRUST FEDERAL 149-98-26A-35-7H
30728	230726 NENE 26-149-98	BERG TRUST FEDERAL 149-98-26A-35-9H
30729	130729 NENE 26-149-98	BERG TRUST FEDERAL 149-98-26A-35-10H
30783	226906 SWSE 19-152-93	FORT BERTHOLD 152-93-19D-18-12H
30784	226906 SWSE 19-152-93	FORT BERTHOLD 152-93-19D-18-8H
30785	226906 SWSE 19-152-93	FORT BERTHOLD 152-93-19D-18-9H
31076	225597 SESW 35-148-94	FORT BERTHOLD 147-94-2B-11-6H
31077	225597 SESW 35-148-94	FORT BERTHOLD 147-94-2B-11-7H
31078	225597 SESW 35-148-94	FORT BERTHOLD 147-94-2B-11-8H
31080	225597 SESW 35-148-94	FORT BERTHOLD 147-94-2B-11-9H
31081	226293 SESW 35-148-94	FORT BERTHOLD 148-94-35C-26-10H
31082	226293 SESW 35-148-94	FORT BERTHOLD 148-94-35C-26-7H
31083	226293 SESW 35-148-94	FORT BERTHOLD 148-94-35C-26-9H
31084	226293 SESW 35-148-94	FORT BERTHOLD 148-94-35C-26-8H
31085	226293 SESW 35-148-94	FORT BERTHOLD 148-94-35C-26-6H
31154	224297 NWNE 13-148-95	FORT BERTHOLD 148-95-13A-24-6H
31155	231155 NWNE 13-148-95	FORT BERTHOLD 148-95-13A-24-7H
31156	231155 NWNE 13-148-95	FORT BERTHOLD 148-95-13A-24-8H
31161	223223 NENE 22-148-94	FORT BERTHOLD 148-94-22A-27-11H
31188	220919 SESW 24-148-95	FORT BERTHOLD 148-95-25B-36-8H
31454	231454 LOT3 3-150-94	FB JAMES 150-94-3A-10-10T
31455	231454 LOT3 3-150-94	FB JAMES 150-94-3B-10-11B
31456	231454 LOT3 3-150-94	FB JAMES 150-94-3B-10-12T
31457	231454 LOT3 3-150-94	FB JAMES 150-94-3B-10-13B
31458	231454 LOT3 3-150-94	FB JAMES 150-94-3A-10-6B
31462	226279 SESW 36-148-94	FORT BERTHOLD 148-94-36C-25-7H

31464	226279 SESW 36-148-94	FORT BERTHOLD 148-94-36C-25-8H
31697	131697 NENE 22-148-94	FORT BERTHOLD 148-94-22A-27-12H
31774	231774 NWNW 26-151-94	FORT BERTHOLD 151-94-27A-34-16H
31775	231774 NWNW 26-151-94	FORT BERTHOLD 151-94-26B-35-15H
31776	231776 NWNW 26-151-94	FORT BERTHOLD 151-94-26B-35-12H
31777	231776 NWNW 26-151-94	FORT BERTHOLD 151-94-26B-35-11H
31778	231776 NWNW 26-151-94	FORT BERTHOLD 151-94-26B-35-10H
31889	231889 SESE 22-152-94	FORT BERTHOLD 152-94-22D-15-10H
31890	231889 SESE 22-152-94	FORT BERTHOLD 152-94-22D-15-11H
31994	231994 NENE 13-152-94	FORT BERTHOLD 152-94-13A-24-15H
31995	231994 NENE 13-152-94	FORT BERTHOLD 152-94-13A-24-16H
32156	218905 NENW 13-152-94	FORT BERTHOLD 152-94-13B-24-12H
32157	218905 NENW 13-152-94	FORT BERTHOLD 152-94-13B-24-11H
32158	218905 NWNW 13-152-94	FORT BERTHOLD 152-94-13B-24-13H
32232	224737 NWNE 15-152-94	FORT BERTHOLD 152-94-15A-22-9H
32233	224737 NENW 15-152-94	FORT BERTHOLD 152-94-15B-22-8H
32409	SESE 9-148-94	FORT BERTHOLD 148-94-9D-4-7H
32410	SESE 9-148-94	FORT BERTHOLD 148-94-9D-4-6H
32411	SESE 9-148-94	FORT BERTHOLD 148-94-9D-4-12H
32431	231776 NWNW 26-151-94	FORT BERTHOLD 151-94-26B-35-13H
32503	232503 NENE 1-147-94	FORT BERTHOLD 147-94-1A-12-11H
32504	220880 NENE 1-147-94	FORT BERTHOLD 148-94-36D-25-11H
32505	232503 NENE 1-147-94	FORT BERTHOLD 147-94-1A-12-12H
32506	132506 NENE 1-147-94	FORT BERTHOLD 148-94-36D-25-10H
32579	230243 SESW 7-152-93	FORT BERTHOLD 152-93-7C-6-5H
32580	230243 SESW 7-152-93	FORT BERTHOLD 152-93-7C-6-14H
32608	232608 SESE 35-148-94	FORT BERTHOLD 148-94-35D-26-11H
32609	SESE 35-148-94	FORT BERTHOLD 147-94-2A-11-13H-V
32610	SESE 35-148-94	FORT BERTHOLD 147-94-2A-11-12H-V
32611	218313 SESE 35-148-94	FORT BERTHOLD 148-94-35D-26-12H
32612	218313 SESE 35-148-94	FORT BERTHOLD 148-94-35D-26-13H
32613	SESE 35-148-94	FORT BERTHOLD 147-94-2A-11-11H-V
33124	226280 SESW 36-148-94	FORT BERTHOLD 147-94-1B-12-13H

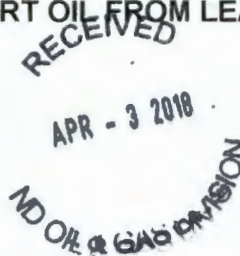
33125	226280 SESW 36-148-94	FORT BERTHOLD 147-94-1B-12-8H
33335	222495 LOT3 1-156-101	BORRUD 156-101-1A-12-4H
33336	222495 LOT3 1-156-101	BORRUD 156-101-1A-12-5H
33594	230555 NWNW 13-148-95	FORT BERTHOLD 148-95-13B-24-9H
34254	134254 SESE 14-141-96	SADOWSKY 14-11-2H
34528	222312 NWNE 28-148-94	FORT BERTHOLD 148-94-28A-33-14H
34529	222312 NWNE 28-148-94	FORT BERTHOLD 148-94-28A-33-15H
34532	230726 NENE 26-149-98	BERG TRUST FEDERAL 149-98-26A-35-8H
34887	218206 SWSE 35-148-94	FORT BERTHOLD 147-94-2A-11-11H
34888	218206 SWSE 35-148-94	FORT BERTHOLD 147-94-2A-11-12H
34889	134889 SWSE 35-148-94	FORT BERTHOLD 147-94-2A-11-13H
34890	232608 SWSE 35-148-94	FORT BERTHOLD 148-94-35D-26-14H
34961	225524 SESW 2-152-94	FORT BERTHOLD 152-94-11B-14-8H
34962	225524 SESW 2-152-94	FORT BERTHOLD 152-94-11B-14-9H
34963	225524 SESW 2-152-94	FORT BERTHOLD 152-94-11B-14-10H
34964	225524 SESW 2-152-94	FORT BERTHOLD 152-94-11B-14-11H
34965	225524 SESW 2-152-94	FORT BERTHOLD 152-94-11B-14-12H
34966	225524 SESW 2-152-94	FORT BERTHOLD 152-94-11B-14-18H
35487	NENE 27-151-94	FB LEVIATHAN 151-94-27A-34-10T
35488	NENE 27-151-94	FB LEVIATHAN 151-94-27A-34-11B
35489	NENE 27-151-94	FB LEVIATHAN 151-94-27A-34-14T2
35490	NENE 27-151-94	FB LEVIATHAN 151-94-27A-34-13B
35491	NENE 27-151-94	FB LEVIATHAN 151-94-27A-34-15T
35492	NENE 27-151-94	FB LEVIATHAN 151-94-27A-34-16B
35493	NENE 27-151-94	FB LEVIATHAN 151-94-27A-34-19T2
35508	NENW 29-148-94	FB CLINTON 148-94-29B-32-6T
35509	NENW 29-148-94	FB CLINTON 148-94-29B-32-7B
35510	NENW 29-148-94	FB CLINTON 148-94-29B-32-8T
35511	NENW 29-148-94	FB CLINTON 148-94-29B-32-9B
35512	NENW 29-148-94	FB CLINTON 148-94-29B-32-10B
35513	NENW 29-148-94	FB CLINTON 148-94-29B-32-11T
35539	223554 SESE 14-152-94	FORT BERTHOLD 152-94-14D-11-19H
35540	223554 SESE 14-152-94	FORT BERTHOLD 152-94-14D-11-16H
35541	235541 SESE 14-152-94	FORT BERTHOLD 152-94-14D-2-15H3
35542	235541 SESE 14-152-94	FORT BERTHOLD 152-94-14D-2-13H3
35716	NENE 27-151-94	FB LEVIATHAN 151-94-27A-34-12T
35717	NENE 27-151-94	FB LEVIATHAN 151-94-27A-34-17T
35718	NENE 27-151-94	FB LEVIATHAN 151-94-27A-34-18B

35806	222495 LOT3 1-156-101	BORRUD 157-100-33C-21-1H3
35962	231454 LOT3 3-150-94	FB JAMES 150-94-3A-10-7T
35963	231454 LOT3 3-150-94	FB JAMES 150-94-3A-10-8T2
35964	231454 LOT3 3-150-94	FB JAMES 150-94-3A-10-9B
35983	226815 LOT4 3-157-99	WM JOHNSON 157-99-3B-10-4B
35984	226815 LOT3 3-157-99	WM HELSTAD 158-99-34C-27-4B
36127	222495 LOT3 1-156-101	BORRUD 156-101-1B-12-3H
36192	226815 LOT4 3-157-99	WM JOHNSON 157-99-3B-10-1T
36302	NENE 27-148-95	FB BELFORD 148-95-22D-15-14B-LL
36303	NENE 27-148-95	FB BELFORD 148-95-22D-15-13T-LL
36304	NWNE 27-148-95	FB BELFORD 148-95-22D-15-10B
36305	NWNE 27-148-95	FB BELFORD 148-95-22D-15-8T
36306	NWNE 27-148-95	FB BELFORD 148-95-22D-15-7B
36307	NWNE 27-148-95	FB BELFORD 148-95-22D-15-6T
36653	221800 LOT8 8-152-93	FB BONITA 152-93-9B-10-9T
36654	221800 LOT8 8-152-93	FB BONITA 152-93-9B-10-10B
36655	221800 LOT8 8-152-93	FB BONITA 152-93-9B-10-12T
36656	221800 LOT8 8-152-93	FB BONITA 152-93-9B-10-13B
36657	221800 LOT8 8-152-93	FB BONITA 152-93-9B-10-14T
36658	221800 LOT8 8-152-93	FB BONITA 152-93-9B-10-15B
36710	LOT4 19-148-94	FORT BERTHOLD 148-95-25A-36-12H
36711	LOT4 19-148-94	FORT BERTHOLD 148-95-25A-36-10H
36712	SESW 19-148-94	FORT BERTHOLD 148-95-25A-36-9H
36713	LOT4 19-148-94	FORT BERTHOLD 148-94-30B-31-14H
36714	SESW 19-148-94	FORT BERTHOLD 148-94-30B-31-13H
36715	SESW 19-148-94	FORT BERTHOLD 148-94-30B-31-11H
36716	SESW 19-148-94	FORT BERTHOLD 148-94-30B-31-6H
36717	LOT4 19-148-94	FORT BERTHOLD 148-94-19C-18-8H
36718	LOT4 19-148-94	FORT BERTHOLD 148-94-19C-18-7H
36719	LOT4 19-148-94	FORT BERTHOLD 148-94-19C-18-6H
37117	LOT4 1-157-99	WM BROWN 157-99-1B-12-2B-LL
37118	LOT4 1-157-99	WM Brown 157-99-2A-11-3T
37119	LOT4 1-157-99	WM BROWN 157-99-1B-12-4B
37120	LOT4 1-157-99	WM BROWN 157-99-1B-12-5T
37121	LOT4 1-157-99	WM BROWN 157-99-1B-12-6B
37122	LOT4 1-157-99	WM BROWN 158-99-35D-26-3B-LL
37123	LOT4 1-157-99	WM BROWN 158-99-36C-25-5B
37124	LOT4 1-157-99	WM BROWN 158-99-36C-25-4T
37125	LOT4 1-157-99	WM BROWN 158-99-36C-25-7B
37126	LOT4 1-157-99	WM BROWN 158-99-36C-25-6T

37127	LOT4 1-157-99	WM BROWN 158-99-36D-25-9B
37233	NENE 25-157-101	WM POLAR 157-101-24D-13-3B
37234	NENE 25-157-101	WM POLAR 157-101-24D-13-5B
37235	NENE 25-157-101	WM POLAR 157-101-24C-13-7B
37464	NWNW 25-157-102	WM Ann Thome 157-102-24C-13-2B
90154	SESE 1-157-100	WM MARMON SWD 157-100-1D-2
90155	NESE 1-157-100	WM MARMON SWD 157-100-1D-1
90211	SWSW 1-157-103	MANGER 1 SWD
90227	NWNW 28-157-102	SIIRTOLA 1 SWD

**AUTHORIZATION TO PURCHASE AND TRANSPORT OIL FROM LEASE - FORM 8**

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



Well File No.	20749
NDIC CTB No.	120749

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

Well Name and Number MARLENE STEFFAN 1-5-8H-141-97	Qtr-Qtr SWSE	Section 32	Township 142 N	Range 97 W	County DUNN
Operator BRUIN E & P OPERATING, LLC	Telephone Number 713-456-3000	Field ST ANTHONY			
Address 602 SAWYER ST, SUITE 710	City HOUSTON	State TX	Zip Code 77007-7510		

Name of First Purchaser CONCORD ENERGY LLC	Telephone Number (303) 468-1900	% Purchased 100	Date Effective April 1, 2017
Principal Place of Business 1401 17TH STR SUITE 1500	City DENVER	State CO	Zip Code 80016
Field Address 3804 17TH Ave NE	City WATFORD CITY	State ND	Zip Code 58854
Name of Transporter BIG LEASE TRUCKING, LLC	Telephone Number (701) 764-7212	% Transported 100	Date Effective April 1, 2018
Address 2036 ROUGH STOCK ROAD	City KILLDDER	State ND	Zip Code 58640

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

Other First Purchasers Purchasing From This Lease	% Purchased	Date Effective
Other First Purchasers Purchasing From This Lease	% Purchased	Date Effective
Other Transporters Transporting From This Lease	% Transported	Date Effective
Other Transporters Transporting From This Lease	% Transported	Date Effective
Comments		

I hereby swear or affirm that the information provided is true, complete and correct as determined from all available records.		Date March 28, 2018
Signature 	Printed Name JANET DASSINGER	Title LEAD PRODUCTION ANALYST
Above Signature Witnessed By		
Witness Signature 	Witness Printed Name JAMIE KROGH	Witness Title PRODUCTION ANALYST

FOR STATE USE ONLY

Date Approved	APR 11 2018
By	
Title	Oil & Gas Production Analyst

**SUNDRY NOTICES AND REPORTS ON WELLS - FORM 4**

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

RECEIVED**APR 21 2017**

Well File No.

20749

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

ND Oil & Gas Div.

☐ Notice of Intent	Approximate Start Date February 6, 2017
☒ Report of Work Done	Date Work Completed February 7, 2017
☐ 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	Pump/Rod Repair

Well Name and Number MARLENE STEFFAN 1-5-8H-141-97					
Footages	Qtr-Qtr	Section	Township	Range	
310 F S L 1420 F E L	SWSE	32	142 N	97 W	
Field	Pool	County			
ST. ANTHONY	BAKKEN	DUNN			

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

API No: 33-025-01358
Production Method is artificial lift. Changed out bad polish rod and pump.
Pump Details: 1 1/2" x 30' RHBM w/ Brush Packoff
Rod Details: 1 - 1 1/2" Polish Rod (New), 94 - 1" EL Rods, 111 - 7/8" EL Rods, 134 - 3/4" EL Rods, 8 - 1 1/2" K-bar w/ patco subs in between, 1 - 1" Patco Sub.
Current Production: 17 BOPD, 36 BWPD, 17 MCFPD

Company Bruin E&P Operating, LLC		Telephone Number (713) 456-3000	
Address 602 Sawyer St., STE 710			
City Houston		State TX	Zip Code 77007
Signature 	Printed Name Jamie Bernstein		
Title Production Analyst	Date April 17, 2017		
Email Address jbernstein@bruinep.com			

FOR STATE USE ONLY

☒ Received	☐ Approved
Date 4/21/17	
By 	
Title Paul Sepurina	

**AUTHORIZATION TO PURCHASE AND TRANSPORT OIL FROM LEASE - FORM 8**

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

RECEIVED

MAR 27 2017

Well File No.	20749
NDIC CTB No.	120749

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

Well Name and Number MARLENE STEFFAN 1-5-8H-141-97	City-Gr SWSE	Section 32	Township 142 N	Range 97 W	County DUNN
Operator Bruin E&P Operating, LLC	Telephone Number (713) 456-3000	Field ST. ANTHONY			
Address 602 Sawyer St. Ste 710	City Houston	State TX	Zip Code 77007		

Name of First Purchaser Concord Energy LLC	Telephone Number (303) 468-1900	% Purchased 100	Date Effective April 1, 2017
Principal Place of Business North Dakota	City	State	Zip Code
Field Address 1401 17th St. Suite 1500	City Denver	State CO	Zip Code 80016
Name of Transporter Concord Energy Transportation LLC	Telephone Number (701) 842-2580	% Transported 100	Date Effective April 1, 2017
Address 3804 17th Ave. NE	City Watford City	State ND	Zip Code 58854
The above named producer authorizes the above named purchaser to purchase the percentage of oil stated above which is produced from the lease designated above until further notice. The oil will be transported by the above named transporter.			

Other First Purchasers Purchasing From This Lease	% Purchased	Date Effective
Other First Purchasers Purchasing From This Lease	% Purchased	Date Effective
Other Transporters Transporting From This Lease	% Transported	Date Effective
Other Transporters Transporting From This Lease	% Transported	Date Effective
Comments		

I hereby swear or affirm that the information provided is true, complete and correct as determined from all available records.		Date March 23, 2017
Signature 	Printed Name Tim McGhee	Title VP Land

Above Signature Witnessed By		
Witness Signature 	Witness Printed Name Bridget Wheatley	Witness Title Geotechnical Engineer

FOR STATE USE ONLY

Date Approved	APR 03 2017
By	
Title	Oil & Gas Production Analyst

**AUTHORIZATION TO PURCHASE AND TRANSPORT OIL FROM LEASE - FORM 8**

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

RECEIVED

JAN 06 2017

Well File No.	20749
NDIC CTB No.	120749

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

ND Oil & Gas Div.

Well Name and Number MARLENE STEFFAN 1-5-8H-141-97	Qtr-Qtr SWSE	Section 32	Township 142 N	Range 97 W	County DUNN
Operator Bruin E&P Operating, LLC	Telephone Number (713) 456-3000	Field ST. ANTHONY			
Address 602 Sawyer St. Ste 710	City Houston	State TX	Zip Code 77007		

Name of First Purchaser Eighty-Eight Oil LLC	Telephone Number (307) 237-9301	% Purchased 100	Date Effective January 2, 2017
Principal Place of Business North Dakota	City Casper	State WY	Zip Code 82602
Field Address PO Drawer 2360, 455 N. Poplar	City	State	Zip Code
Name of Transporter Black Hills Trucking	Telephone Number (307) 237-9301	% Transported 100	Date Effective January 2, 2017
Address PO Drawer 2360, 455 N. Poplar	City Casper	State WY	Zip Code 82602

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

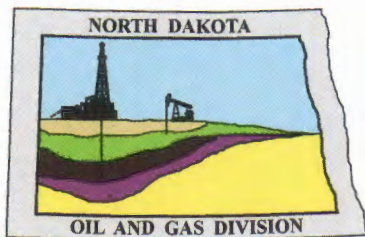
Other First Purchasers Purchasing From This Lease	% Purchased	Date Effective
Other First Purchasers Purchasing From This Lease	% Purchased	Date Effective
Other Transporters Transporting From This Lease	% Transported	Date Effective
Other Transporters Transporting From This Lease	% Transported	Date Effective
Comments		

I hereby swear or affirm that the information provided is true, complete and correct as determined from all available records.		Date 1-4-2017
Signature 	Printed Name Timothy McGhee	Title Vice President Land

Above Signature Witnessed By		
Witness Signature 	Witness Printed Name Bridget Whentley	Witness Title Geotechnical Engineer

FOR STATE USE ONLY

Date Approved JAN 23 2017
By
Title Oil & Gas Production Analyst



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/

January 20, 2017

Bruin E&P Operating, LLC
602 Sawyer St., Ste 710
Houston, TX 77007

RE: CHANGE OF OPERATOR FROM LIME ROCK RESOURCES III-A, L.P. TO BRUIN
E&P OPERATING, LLC.
60 Wells

Dear S. Tyler Crabtree,

Please find enclosed a copy of the approved Form 15, Notice of Transfer of Oil and Gas Wells, in regard to the above-referenced matter. This transfer has now been approved and subject well is now covered by Bond No. B010221.

If you should have any questions, please feel free to contact this office.

Sincerely,

Rachel Morris
Administrative Assistant

Enclosure:

cc: Lime Rock Resources III-A, L.P.
1111 Bagby St., Ste 4600
Houston, TX 77002

**NOTICE OF TRANSFER OF OIL AND GAS WELLS - FORM 15**

INDUSTRIAL COMMISSION OF NORTH DAKOTA

OIL AND GAS DIVISION

600 EAST BOULEVARD DEPT 405

BISMARCK, ND 58505-0840

SFN 5762 (03-2000)

FOR STATE USE ONLY

NDIC Bond Number

B377

RECEIVED

JAN 04 2017

PLEASE READ INSTRUCTIONS BEFORE FILLING OUT FORM. PLEASE SUBMIT THE ORIGINAL AND TWO COPIES OF THIS NOTICE ALONG WITH A FEE OF \$25.00 PER WELL SHALL BE FILED AT LEAST THIRTY DAYS BEFORE THE CLOSING DATE OF TRANSFER.

TRANSFERRING OPERATOR

Name of Operator Representative Charles Adcock			
Operator Transferring Oil and/or Gas Wells Lime Rock Resources III-A, L.P.			Telephone Number (713) 292-9510
Address 1111 Bagby St., Ste. 4600	City Houston	State TX	Zip Code 77002
I, the above named representative, acknowledge the transfer of the oil and/or gas wells named below for the purpose of ownership and/or operation to the company named below.			
Signature 	Title (Must be an officer or power of attorney must be attached) Co-Chief Executive Officer		Date 11/21/2016

Well File Number	Requested Official Well Name and Number	Location (Qtr-Qtr, S-T-R)	Assignment Date
	See Attached Well List CL#1050 \$1,500- 1-4-17 mh		11/21/2016 TH

RECEIVING OPERATOR

Name of Operator Representative S. Tyler Crabtree			
Operator Receiving Oil and/or Gas Wells Bruin E&P Operating, LLC			Telephone Number (713) 456-3000
Address 602 Sawyer St., Ste 710	City Houston	State TX	Zip Code 77007
I, the above named representative, have read the foregoing statement and accept such transfer, also the responsibility of ownership and/or operation of said well or wells, under the said company bond, said bond being tendered to or on file with the Industrial Commission of North Dakota.			
Signature 	Title (Must be an officer or power of attorney must be attached) CFO		Date 11/21/2016

SURETY COMPANY

Surety U.S. Specialty Insurance Company		Telephone Number (713) 355-3100		Amount of Bond \$ \$100,000	
Address 13403 Northwest Freeway	City Houston	State TX	Zip Code 77040	Bond Number B010221	
The above named SURETY agrees that such bond shall extend to compliance with Chapter 38-08 of North Dakota Century Code and amendments and the rules and regulations of the Industrial Commission of North Dakota prescribed to govern the production of oil and gas on government and private lands within the State of North Dakota, in relation to the above stated transfer; it being further agreed and understood that the bond sum or amount is not to be considered increased because of such extension.					
Signature 		Title (Must be an officer or power of attorney must be attached) Attorney-in-Fact		Date November 17, 2016	
Printed Name Meredith K. Anderson					

FOR STATE USE ONLY

Date Approved January 20, 2017
By Bruce E. Zabo
Title Assistant Director

WELL NAME	API	STATE	COUNTY
JOHN KINNE 1-27-34H-142-98	33007017780000	NORTH DAKOTA	BILLINGS
JOHN KINNE 2-27-34H-142-98	33007018180000	NORTH DAKOTA	BILLINGS
KUNTZ 1-23-14H-142-98	33007017440000	NORTH DAKOTA	BILLINGS
RICHARD LONGFELLOW 1-22-15H-142-98	33007017790000	NORTH DAKOTA	BILLINGS
ALFRED SADOWSKY 1-36-1H-141-96	33025011600000	NORTH DAKOTA	DUNN
ANNIE OAKLEY 1-20-17H-142-94	33025014940000	NORTH DAKOTA	DUNN
BILL CODY 1-29-20H-141-96	33025015460000	NORTH DAKOTA	DUNN
BINSTOCK 1-34-27H-142-96	33025016230000	NORTH DAKOTA	DUNN
CHARLES DAVIS 1-4-9H-142-94	33025018400000	NORTH DAKOTA	DUNN
COYOTE CREEK 1-20-17H-142-97	33025014920000	NORTH DAKOTA	DUNN
DVORAK 10-1H	33025007590000	NORTH DAKOTA	DUNN
DVORAK 11-4H	33025005780000	NORTH DAKOTA	DUNN
DVORAK TRUST 1-6-31H-142-96	33025013000000	NORTH DAKOTA	DUNN
EASTON 1-35-26H-142-95	33025016260000	NORTH DAKOTA	DUNN
ELSIE DVORAK 1-8-17H-141-96	33025012430000	NORTH DAKOTA	DUNN
FISHER STATE 1-21-16H-142-97	33025011550000	NORTH DAKOTA	DUNN
FRANK ANDERS 1-27-34H-142-95	33025018110000	NORTH DAKOTA	DUNN
GEORGE MILLER 1-11-2H-142-95	33025013600000	NORTH DAKOTA	DUNN
GORDON PAVLICEK 1-17-20H-141-95	33025012380000	NORTH DAKOTA	DUNN
HATIE DVORAK 1-33-28H-142-96	33025016270000	NORTH DAKOTA	DUNN
HAVELKA 1-19-18H-142-95	33025015750000	NORTH DAKOTA	DUNN
HENRY GURKE 1-30-19H-141-96	33025018790000	NORTH DAKOTA	DUNN
JAEGER 1-10-15H-141-96	33025009610000	NORTH DAKOTA	DUNN
JOESPH CARTER 1-13-12H-141-96	33025018180000	NORTH DAKOTA	DUNN
KADRMAS 11-27H	33025008940000	NORTH DAKOTA	DUNN
KATIE HEISER 1-1-12H-142-95	33025013590000	NORTH DAKOTA	DUNN
KEARY KADRMAS 1-32-29H-142-96	33025015370000	NORTH DAKOTA	DUNN
KEARY KADRMAS 2-32-29H-142-96	33025022740000	NORTH DAKOTA	DUNN
KUDRNA 1-17	33025013510000	NORTH DAKOTA	DUNN
LOREN HAGEN 1-35-26H-141-97	33025018800000	NORTH DAKOTA	DUNN
LOUIE PAVLICEK 1-28-33H-142-97	33025016110000	NORTH DAKOTA	DUNN
MARLENE STEFFAN 1-5-8H-141-97	33025013580000	NORTH DAKOTA	DUNN
MAURICE HECKER 1-19-18H-142-97	33025014390000	NORTH DAKOTA	DUNN
MAURICE HECKER 2-19-18H-142-97	33025024920000	NORTH DAKOTA	DUNN
MEDUNA TRUST 1-7-6H-142-94	33025018480000	NORTH DAKOTA	DUNN
MONGOOSE 1-13-24H-142-95	33025015690000	NORTH DAKOTA	DUNN
NELS WOLD 1-36-25H-141-97	33025018700000	NORTH DAKOTA	DUNN
NOVASIO STATE 1-16-21H	33025012260000	NORTH DAKOTA	DUNN
PAVLICEK 44-32H	33025005810000	NORTH DAKOTA	DUNN
PRIVRATSKY 1-28-33H-141-95	33025014870000	NORTH DAKOTA	DUNN
RICHARD JABLONSKY 1-13-24H-141-97	33025015720000	NORTH DAKOTA	DUNN
RIDL 1-24-25H-142-96	33025018710000	NORTH DAKOTA	DUNN
SADOWSKY 24-14H	33025008680000	NORTH DAKOTA	DUNN
SADOWSKY 34-12H	33025009200000	NORTH DAKOTA	DUNN
SCHAFNER 1-29-32H-142-95	33025017300000	NORTH DAKOTA	DUNN
SICKLER 22-1H	33025007320000	NORTH DAKOTA	DUNN
SICKLER STATE 21-04H	33025009020000	NORTH DAKOTA	DUNN
STATE DVORAK 1-9-16H-141-96	33025012630000	NORTH DAKOTA	DUNN
STATE FISHER 2-21-16H-142-97	33025016120000	NORTH DAKOTA	DUNN
STATE FRANK BUTLER 1-29-32H-142-94	33025017010000	NORTH DAKOTA	DUNN

WELL NAME	API	STATE	COUNTY
STATE JABLONSKY 1-1-12H-141-95	33025014930000	NORTH DAKOTA	DUNN
STATE JAEGER 1-21-16H-142-94	33025012990000	NORTH DAKOTA	DUNN
STATE JOBLONSKY B 1-36-25H-142-95	33025016130000	NORTH DAKOTA	DUNN
STATE LITTLE KNIFE 1-20-17H-142-95	33025017310000	NORTH DAKOTA	DUNN
STATE LITTLE MISSOURI 1-30-31H-142-95	33025015840000	NORTH DAKOTA	DUNN
STATE MARSH 1-34-27H-142-97	33025013080000	NORTH DAKOTA	DUNN
STATE POLENSKY 1-35-36H-142-97	33025013040000	NORTH DAKOTA	DUNN
TERRY DVORAK 1-15-22H-142-95	33025013370000	NORTH DAKOTA	DUNN
WOLBERG 21-18H	33025011110000	NORTH DAKOTA	DUNN
WOODROW KEEBLE 1-21-22H-141-96	33025019500000	NORTH DAKOTA	DUNN



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/

June 7, 2016

Mr. Lloyd Armstrong
Lime Rock Resources III-A, L.P.
1111 Bagby Street, Suite 4600
Houston, TX 77002

**RE: Marlene Steffan #1-5-8H-141-97
SWSE Sec. 32, T.142N., R.97W.
Dunn County, North Dakota
St. Anthony Field
Well File No. 20749
STRIPPER WELL DETERMINATION**

Dear Mr. Armstrong:

Lime Rock Resources III-A, L.P. (Lime Rock) filed with the North Dakota Industrial Commission – Oil and Gas Division (Commission) on May 9, 2016 an amended application for a Stripper Well Property Determination for the above captioned well.

Information contained in the application indicates that the above mentioned well is a property pursuant to statute and rule, and Lime Rock has elected to designate said well as a separate property for stripper well purposes. The well produced from a well depth greater than 10000 feet. During the qualifying period, August 1, 2014 through July 31, 2015, the well produced at a maximum efficient rate and the average daily production from the well was 21.6 barrels of oil per day during this period.

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

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

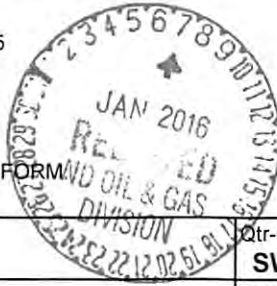
Sincerely,

David J. McCusker
Petroleum Engineer

Cc: ND Tax Department

**AUTHORIZATION TO PURCHASE AND TRANSPORT OIL FROM LEASE - FORM 8**

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



Well File No. 20749
NDIC CTB No. 120749

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

Well Name and Number Steffan, Marlene 1-5-8H-141-97	Qtr-Qtr SW SE	Section 32	Township 142 N	Range 97 W	County Dunn
Operator Lime Rock Resources III-A, LP	Telephone Number 713/292-9510	Field St. Anthony			
Address 1111 Bagby St., Ste. 4600	City Houston	State TX	Zip Code 77002		

Name of First Purchaser Lime Rock Resources III-A, LP	Telephone Number 713/292-9510	% Purchased 100	Date Effective December 1, 2015
Principal Place of Business 1111 Bagby St., Ste. 4600	City Houston	State TX	Zip Code 77002
Field Address 3239 Highway 22	City Dickinson	State ND	Zip Code 58601
Name of Transporter Black Hills Trucking, Inc.	Telephone Number 307/237-9301	% Transported 100	Date Effective December 1, 2015
Address P.O. Box 2360	City Casper	State WY	Zip Code 82602

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

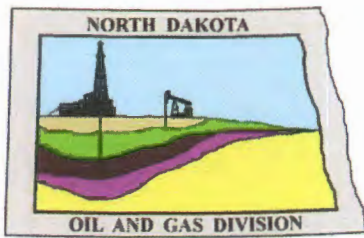
Other First Purchasers Purchasing From This Lease	% Purchased	Date Effective
Other First Purchasers Purchasing From This Lease	% Purchased	Date Effective
Other Transporters Transporting From This Lease	% Transported	Date Effective
Other Transporters Transporting From This Lease	% Transported	Date Effective
Comments		

I hereby swear or affirm that the information provided is true, complete and correct as determined from all available records.		Date 1/5/16
Signature <i>Carla Martin</i>	Printed Name Carla Martin	Title Regulatory Tech

Above Signature Witnessed By		
Witness Signature <i>Dennis Nelson</i>	Witness Printed Name Dennis Nelson	Witness Title Production Analyst

FOR STATE USE ONLY

Date Approved MAR 23 2016
By <i>Annette Trebo</i>
Title Oil & Gas Production Analyst



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

March 22, 2016

Charles W. Adcock
Lime Rock Resources III-A, L.P.
1111 Bagby St., Ste 4600
Houston, TX 77002

RE: CHANGE OF OPERATOR FROM OXY USA, INC. TO LIME ROCK RESOURCES
III-A, L.P.
340 WELLS

Dear Charles W. Adcock:

Please find enclosed a copy of the approved Form 15, Notice of Transfer of Oil and Gas Wells, in regard to the above-referenced matter. This transfer has now been approved and subject well is now covered by Bond No. B009778.

If you should have any questions, please feel free to contact this office.

Sincerely,

Rachel Morris
Administrative Assistant

Enclosure:

cc: Benard F. Figlock, III
Oxy USA, Inc.
5 Greenway Plaza, Ste 110
Houston, TX 77046

**NOTICE OF TRANSFER OF OIL AND GAS WELLS - FORM 15**

INDUSTRIAL COMMISSION OF NORTH DAKOTA
OIL AND GAS DIVISION
600 EAST BOULEVARD DEPT 405
BISMARCK, ND 58505-0840
SFN 5762 (03-2000)

FOR STATE USE ONLY

NDIC Bond Number

L320

Received

FEB 24 2016

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

THIS NOTICE ALONG WITH A FEE OF \$25.00 PER WELL SHALL BE FILED AT LEAST THIRTY DAYS BEFORE THE CLOSING DATE OF TRANSFER.

TRANSFERRING OPERATOR

Name of Operator Representative <i>Benard F. Fielbeck, III</i>			
Operator Transferring Oil and/or Gas Wells Oxy USA, Inc.			Telephone Number (713) 215-7000
Address 5 Greenway Plaza, Ste. 110	City Houston	State TX	Zip Code 77046
I, the above named representative, acknowledge the transfer of the oil and/or gas wells named below for the purpose of ownership and/or operation to the company named below.			
Signature <i>[Signature]</i>	Title (Must be an officer or power of attorney must be attached) <i>Vice President & Treasurer</i>		Date <i>2/16/16</i>

Well File Number	Requested Official Well Name and Number	Location (Qtr-Qtr, S-T-R)	Assignment Date
	see attached well listing		November 20, 2015

RECEIVING OPERATOR

Name of Operator Representative Charles W. Adcock			
Operator Receiving Oil and/or Gas Wells Lime Rock Resources III-A, LP			Telephone Number (713) 292-9510
Address 1111 Bagby St., Ste. 4600	City Houston	State TX	Zip Code 77002
I, the above named representative, have read the foregoing statement and accept such transfer, also the responsibility of ownership and/or operation of said well or wells, under the said company bond, said bond being tendered to or on file with the Industrial Commission of North Dakota.			
Signature <i>[Signature]</i>	Title (Must be an officer or power of attorney must be attached) Co-Chief Executive Officer		Date <i>7/23/16</i>

SURETY COMPANY

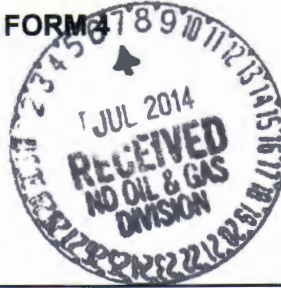
Surety US Specialty Insurance Company		Telephone Number (713) 355-3100	Amount of Bond \$ 100,000
Address 13403 Northwest Freeway	City Houston	State TX	Zip Code 77056
		Bond Number B009778	
The above named SURETY agrees that such bond shall extend to compliance with Chapter 38-08 of North Dakota Century Code and amendments and the rules and regulations of the Industrial Commission of North Dakota prescribed to govern the production of oil and gas on government and private lands within the State of North Dakota, in relation to the above stated transfer; it being further agreed and understood that the bond sum or amount is not to be considered increased because of such extension.			
Signature <i>Michele K. Tyson</i>	Title (Must be an officer or power of attorney must be attached) Attorney-In-Fact		Date February 18, 2016
Printed Name Michele K. Tyson			

FOR STATE USE ONLY

Date Approved <i>March 22, 2016</i>
By <i>Dave E. Hulse</i>
Title Assistant Director

**SUNDRY NOTICES AND REPORTS ON WELLS - FORM 3**

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.
20749

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 March 27, 2014	☐ 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 Name and Number MARLENE STEFFAN 1-5-8H-141-97					
Footages	Qtr-Qtr	Section	Township	Range	
310 F S L 1420 F E L	SWSE	32	142 N	97 W	
Field ST. ANTHONY	Pool BAKKEN	County DUNN			

24-HOUR PRODUCTION RATE					
Before			After		
Oil	0 Bbls		Oil	27 Bbls	
Water	0 Bbls		Water	134 Bbls	
Gas	0 MCF		Gas	15 MCF	

Name of Contractor(s)			
Address	City	State	Zip Code

DETAILS OF WORK

API No: 33-025-01358-00-00

3/12/13 MIRU.
POOH w/ pump and rods. POOH w/ tubing and TAC.
R H and set 4.5" BP @11049' in the liner. Test csg to 2500 psi/30 min, held.
Perf 7" f/ 10945' - 10955' (6SPF). Attempt to set packer and 4.5" frac string unsuccessful.
R H w/ 257 jts. 2.875" 6.5# L-80 EUE 8rd tubing, 2 pup jts 2.875" 6.5# L-80 EUE 8rd tubing, 7" hanger.
3/27/13 RDMO.

Caliper log ran on 4/2/13.

Company OXY USA, Inc.		Telephone Number (713) 985-6346	
Address 5 Greenway Plaza			
City Houston	State TX	Zip Code 77046	
Signature <i>Leslie Reeves</i>	Printed Name Leslie Reeves		
Title Regulatory Analyst	Date July 3, 2014		
Email Address Leslie_Reeves@oxy.com			

FOR STATE USE ONLY	
☒ Received	☐ Approved
Date <i>7/25/14</i>	
By <i>[Signature]</i>	
Title <i>Auto Supervisor</i>	

**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.

20749

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

☐ Notice of Intent	Approximate Start Date
☒ Report of Work Done	Date Work Completed May 25, 2013
☐ 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	Pump Size Decrease

Well Name and Number MARLENE STEFFAN 1-5-8H-141-97							
Footages		Qtr-Qtr	Section	Township	Range		
310 F S L 1420 F E L		SWSE	32	142 N	97 W		
Field ST. ANTHONY		Pool BAKKEN		County DUNN			

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

API No: 33-025-01358-00-00

Production method is artificial lift. The well is on a conventional beam pumping unit and it had a pump failure, so the pump size has been decreased.

Weatherford Maximizer II: P114-117-49

1.75": 25-175-RXBM-30-5

286 jts. of 2.875", 6.5#, L-80, EUE 8 Rd tubing. Total Length 8866'; TAC @ 8999'

Rod Details: 103-1", 126-7/8", 156-6/4", 2 Pony Rods, 1 Polish Rod

Current Production: 63 BOPD, 297 BWPD, 24 MCFPD

Previous Production: 3 BOPD, 30 BWPD, 8 MCFPD

Company OXY USA, Inc.		Telephone Number (713) 366-5303	
Address 5 Greenway Plaza			
City Houston		State TX	Zip Code 77046
Signature <i>Rebecca Zent</i>		Printed Name Rebecca Zent	
Title Regulatory Analyst		Date June 27, 2013	
Email Address Rebecca_Zent@oxy.com			

FOR STATE USE ONLY

☒ Received	☐ Approved
Date <i>July 9, 2013</i>	
By <i>AM Lh</i>	
Title PETROLEUM ENGINEER	



AUTHORIZATION TO PURCHASE AND TRANSPORT OIL FROM LEASE - FORM 8

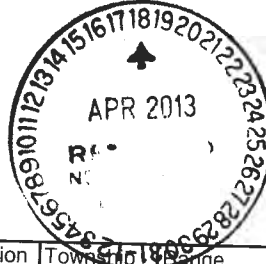
INDUSTRIAL COMMISSION OF NORTH DAKOTA

OIL AND GAS DIVISION

600 EAST BOULEVARD DEPT 405

BISMARCK, ND 58505-0840

SFN 5698 (03-2000)



Well File No.	20749
NDIC CTB No.	120749

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

Well Name and Number MARLENE STEFFAN 1-5-8H-141-97	Qtr-Qtr SWSE	Section 32	Township 142 N	Range 97 W	County Dunn
Operator OXY USA Inc.	Telephone Number 713-985-6346		Field ST. ANTHONY		
Address PO Box 27757	City Houston		State TX	Zip Code 77227-7757	

Name of First Purchaser Occidental Energy Marketing, Inc.	Telephone Number 713-215-7000	% Purchased 100	Date Effective February 1, 2013	
Principal Place of Business 5 Greenway Plaza, Suite 2400	City Houston	State TX	Zip Code 77046	
Field Address NA	City	State	Zip Code	
Name of Transporter Black Hills Trucking Inc.	Telephone Number (701) 225-6881	% Transported 100	Date Effective October 15, 2011	
Address 125 GTA Drive	City Dickinson	State ND	Zip Code 58602-0250	
The above named producer authorizes the above named purchaser to purchase the percentage of oil stated above which is produced from the lease designated above until further notice. The oil will be transported by the above named transporter.				

Other First Purchasers Purchasing From This Lease	% Purchased	Date Effective
Other First Purchasers Purchasing From This Lease	% Purchased	Date Effective
Other Transporters Transporting From This Lease	% Transported	Date Effective
Other Transporters Transporting From This Lease	% Transported	Date Effective
Comments		

I hereby swear or affirm that the information provided is true, complete and correct as determined from all available records.		Date April 10, 2013
Signature 	Printed Name Leslie Teufel	Title Regulatory Analyst
Above Signature Witnessed By		
Witness Signature 	Witness Printed Name Elizabeth S. Bush-Ivie	Witness Title Regulatory Team Leader

FOR STATE USE ONLY	
Date Approved	
By	
Title	Regulatory Analyst



SUNDRY NOTICES AND REPORTS ON WELLS - FORM 4

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

Well File No.
20749

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

☒ Notice of Intent	Approximate Start Date March 12, 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	

Well Name and Number MARLENE STEFFAN 1-5-8H-141-97							
Footages		Qtr-Qtr	Section	Township	Range		
310 F S L 1420 F E L		SWSE	32	142 N	97 W		
Field ST. ANTHONY		Pool BAKKEN		County DUNN			

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

API No: 33-025-01358-00-00
MIRU, POH w/rods, pump and tbq
CO and RIH w/calliper, GR, CCL - log f/11,000' MD to 8000' MD
RIH and set RBP @ 10990' MD in liner
Perf 10945 - 10955 MD w/ 6 JSPF in the Middle Bakken, total of 60 holes. Perfs through the tie back sleeve and 7" casing above the top of the liner hanger at 10,966'. TOC 1800'.
RIH and set retrievable packer - Baker Model SC2PAH @ 10,200' MD. We are setting the packer above the curve to enable better flow dynamics and so we can pull the RBP through the packer if necessary.
RIH w/ 4 1/2" frac string, latch onto packer. Test tbq & back side MDRO

Rig up frac equipment, pressure monitoring/relief equipment, test equipment for 8000 psi frac.
Frac in 1 stage w/ gelled water. >50% will be produced water. No frac balls to be run.
Flow back and return to production.

approved per our telephone conversation pursuant to 27-1

Company OXY USA, Inc.		Telephone Number (713) 366-5303	
Address 5 Greenway Plaza			
City Houston		State TX	Zip Code 77046
Signature <i>Elizabeth S. Bush-Ivie</i>		Printed Name Elizabeth S. Bush-Ivie, P.E.	
Title Regulatory Team Leader		Date March 11, 2013	
Email Address Elizabeth_Bush@oxy.com			

FOR STATE USE ONLY

☐ Received	☒ Approved
Date 3/18/13	
By <i>Elizabeth S. Bush-Ivie</i>	
Title Regulatory Team Leader	

**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.
20749

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 May 11, 2012	☐ Redrilling or Repair	☐ Shooting
☐ Notice of Intent to Begin a Workover Project that may Qualify for a Tax Exemption Pursuant to NDCC Section 57-51.1-03.	Approximate Start Date	☐ Casing or Liner	☐ Acidizing
		☐ Plug Well	☐ Fracture Treatment
		☐ Supplemental History	☒ Change Production Method
		☐ Temporarily Abandon	☐ Reclamation
		☐ Other	

Well Name and Number MARLENE STEFFAN 1-5-8H-141-97					
Footages	Qtr-Qtr	Section	Township	Range	
310 F S L 1420 F E L	SWSE	32	142 N	97 W	
Field	Pool	County			
ST. ANTHONY	BAKKEN	DUNN			

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

API No: 33-025-01358-00-00

Production method is artificial lift. The well was flowing naturally when Oxy obtained the subject well on 5/3/2011 from prior operator (Anschutz)

Weatherford Maximizer II: RM-912-427-192
2": 25-200-RHBC-30-5
309 Jts of 2.875" L-80 EUE 8 Rd tubing; Total Length 9579'; TAC @ 9650'.
Rods: 115-1"; 143-7/8"; 120-3/4"; 1 Pony Rod; 1 Polish Rod

Current Production: 107 BOPD, 336 BWP, 70 MCFPD
Previous Production: 17 BOPD, 8 BWP, 0 MCFPD

Company OXY USA, Inc.		Telephone Number (701) 264-4921	
Address 5 Greenway Plaza			
City Houston		State TX	Zip Code 77046
Signature <i>Rebecca Zent</i>		Printed Name Rebecca Zent	
Title Regulatory Analyst		Date 8/21/12	
Email Address Rebecca_Zent@oxy.com			

FOR STATE USE ONLY	
☒ Received	☐ Approved
Date <i>September 12, 2012</i>	
By <i>David M. Hilly</i>	
Title <i>Principal</i>	

RESERVE PIT DIAGRAM

Well Name & No.: MARLENE STEFFAN1-5-8H-141-97 Well File No. 20749

Operator: OXY USA INC Location: 32-142N-97W SWSE

Inspector: Nicole Anderson Date: 6/15/11

Maximum Depth 15 Ft.

Lined Y

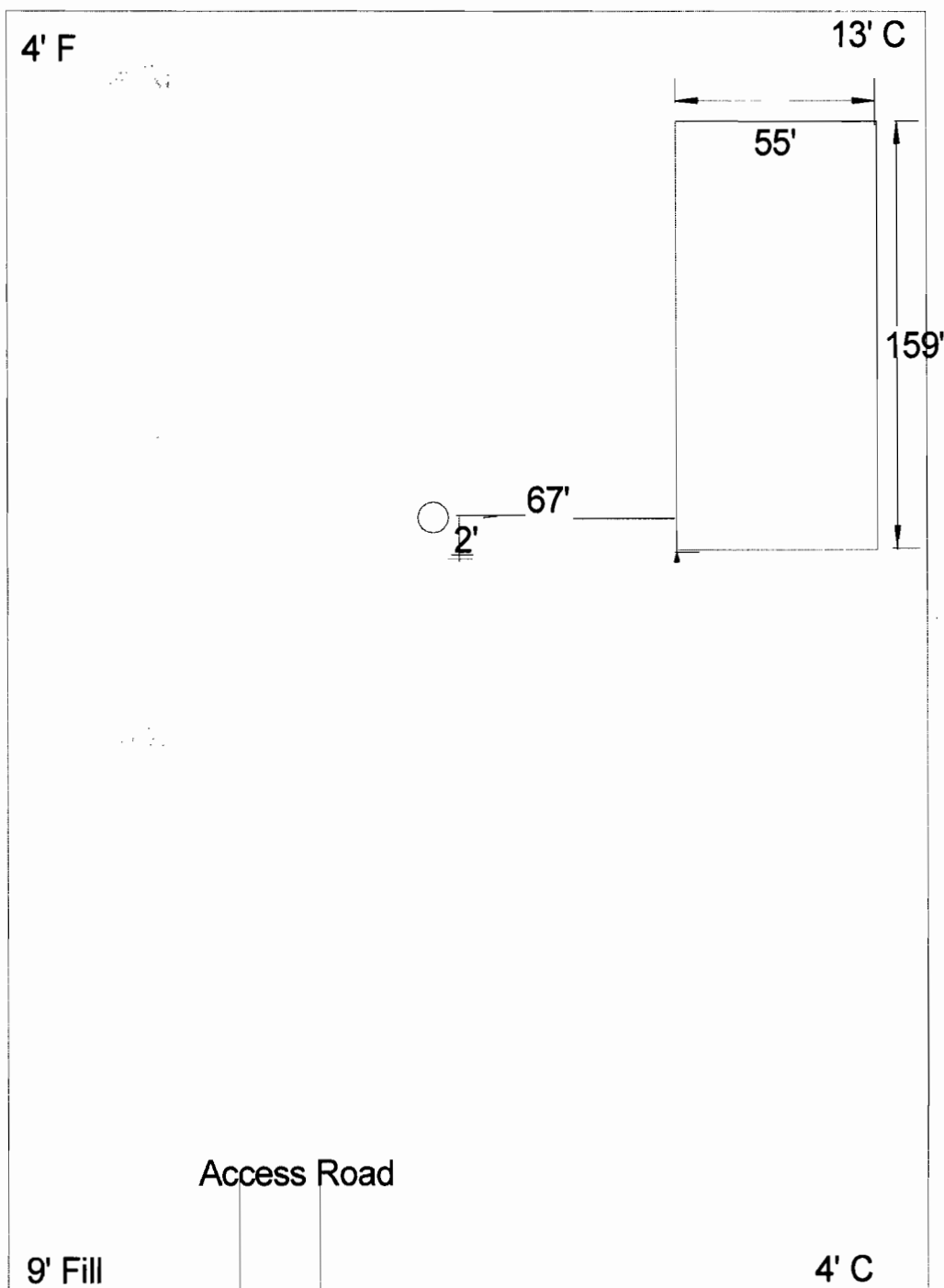
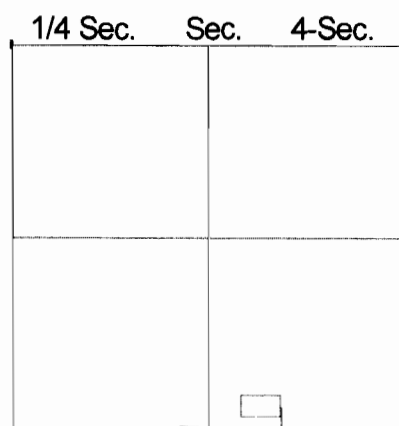
Azimuth of Long Axis
of Pit 90 Degrees.

Sediment Description:

clay



Location of Access Road



NOTE: Diagram shows approximate dimensions and orientation of the reserve pit in relation to the well location. Not a surveyed plat.

**SUNDRY NOTICES AND REPORTS ON WELLS - FORM 4**

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

Well File No.

20749

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

☐ Notice of Intent	Approximate Start Date
☒ Report of Work Done	Date Work Completed September 29, 2011
☐ 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
☐ Temporary Abandon	☒ Reclamation
☐ Other	



Well Name and Number Marlene Steffan 1-5-8H-141-97					
Footages	Qtr-Qtr	Section	Township	Range	
310 F N L 1420 F W L	SWSE	32	142 N	97 W	
Field St Anthony	Pool Bakken	County Dunn			

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

Name of Contractor(s) Flint			
Address 2100 20th Avenue SE	City Minot	State ND	Zip Code 58702

DETAILS OF WORK

OXY USA Inc. closed the pit at this location on 9-29-11 according to the Sundry notice submitted on 9-6-11.

Company OXY USA Inc		Telephone Number 713-350-4917	
Address 5 Greenway Plaza, Suite 110			
City Houston		State Texas	Zip Code 77048
Signature 	Printed Name Terry Ryland		
Title Senior Environmental Advisor	Date 10-13-11		
Email Address terry_ryland@oxy.com			

FOR STATE USE ONLY	
☒ Received	☐ Approved
Date 2-9-12	
By 	
Title HR	



OXY	July 29, 2011
Company	Date
Precision 426	Dunn, ND
Rig	County/State
Survey Depths	Marlene Steffen 1-5-8H-141-97
Type of Survey	Measurements While Drilling (MWD)
Survey Depths	170 to 2215 ft
Type of Survey	_____ ft
Survey Depths	_____ to _____ ft
Type of Survey	_____
Site Supervisor	Jeromy Haggerty


Jing Jing Huang
DEC Engineer

Marlene Steffen 1-5-8H-141-97 MWD 0' to 2215' Survey Report

(Def Survey)



Report Date: July 29, 2011 - 02:03 AM
Client: OXY
Field: ND, Dunn County (NAD 83 SZ) 2011
Structure / Slot: Oxy (Marlene Steffen 1-5-8H-141-97) - Precision 426
Well: Marlene Steffen 1-5-8H-141-97
Borehole: Original Hole
UWI / APW: Unknown / Unknown
Survey Name: Marlene Steffen 1-5-8H-141-97 MWD 0' to 2215'
Survey Date: July 28, 2011
Tort / AHD / DDI / ERD Ratio: 6.233 / 22.238 ft / 2.142 / 0.010
Coordinate Reference System: NAD83 North Dakota State Plane, Southern Zone, US Feet
Location Lat / Long: N 48° 4' 6.15000", W 102° 59' 45.63996"
Location Grid N/E Y/X: N 885668.586 NUS, E 1358200.882 IUS
CRS Grid Convergence Angle: -1.82054707 °
Grid Scale Factor: 1.0001888

Survey / DLS Computation: Minimum Curvature / Lubinski
Vertical Section Azimuth: 179.980 ° (True North)
Vertical Section Origin: 0.000 ft, 0.000 ft
TVD Reference Datum: RKB
TVD Reference Elevation: 2650.900 ft above Unknown
Seabed / Ground Elevation: 2618.000 ft above Unknown
Magnetic Declination: 8.266 °
Total Field Strength: 56722.234 nT
Magnetic Dip Angle: 73.178 °
Declination Date: July 29, 2011
Magnetic Declination Model: BGM 2011
North Reference: True North
Grid Convergence Used: 0.000 °
Total Corr Mag North-True North: 8.266 °
Local Coord Referenced To: Well Head

Comments	MD (ft)	Incl (°)	Azin True (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (ft100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
Surface	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	885666.59	1358200.88	N 48 4 6.15	W 102 59 45.84
Begin MWD Survey	170.00	0.26	199.78	170.00	0.36	-0.36	-0.13	0.15	885666.23	1358200.74	N 48 4 6.15	W 102 59 45.64
	201.00	0.26	210.15	201.00	0.49	-0.49	-0.19	0.15	885666.10	1358200.68	N 48 4 6.15	W 102 59 45.64
	260.00	0.26	224.65	260.00	0.70	-0.70	-0.35	0.11	885665.90	1358200.51	N 48 4 6.14	W 102 59 45.65
	320.00	0.44	218.28	320.00	0.98	-0.98	-0.59	0.31	885665.63	1358200.26	N 48 4 6.14	W 102 59 45.65
	410.00	0.44	214.37	409.99	1.53	-1.54	-1.00	0.03	885665.08	1358199.84	N 48 4 6.13	W 102 59 45.65
	501.00	0.44	212.88	500.99	2.12	-2.12	-1.39	0.01	885664.51	1358199.43	N 48 4 6.13	W 102 59 45.66
	581.00	0.53	219.69	580.99	2.73	-2.73	-1.84	0.12	885663.92	1358198.96	N 48 4 6.12	W 102 59 45.67
	679.00	0.53	263.15	678.99	3.09	-3.09	-2.50	0.45	885663.58	1358198.28	N 48 4 6.12	W 102 59 45.68
	757.00	0.62	279.45	758.98	3.06	-3.06	-3.28	0.24	885663.63	1358197.51	N 48 4 6.12	W 102 59 45.69
	872.00	0.70	276.88	871.97	2.88	-2.88	-4.59	0.07	885663.85	1358198.20	N 48 4 6.12	W 102 59 45.71
	951.00	0.62	273.34	950.97	2.79	-2.80	-5.49	0.11	885663.96	1358195.30	N 48 4 6.12	W 102 59 45.72
	1041.00	0.88	273.56	1040.96	2.72	-2.73	-6.67	0.29	885664.07	1358194.13	N 48 4 6.12	W 102 59 45.74
	1131.00	0.44	294.97	1130.95	2.53	-2.54	-7.67	0.55	885664.29	1358193.13	N 48 4 6.12	W 102 59 45.75
	1221.00	0.79	292.86	1220.95	2.15	-2.15	-8.56	0.39	885664.71	1358192.26	N 48 4 6.13	W 102 59 45.77
	1315.00	0.97	304.37	1314.94	1.44	-1.45	-9.81	0.27	885665.45	1358191.03	N 48 4 6.14	W 102 59 45.78
	1408.00	1.14	305.07	1407.92	0.47	-0.47	-11.22	0.18	885666.47	1358189.85	N 48 4 6.15	W 102 59 45.81
	1502.00	0.79	291.85	1501.91	-0.31	0.30	-12.58	0.44	885667.29	1358188.31	N 48 4 6.15	W 102 59 45.83
	1597.00	0.70	342.47	1596.90	-1.11	1.10	-13.37	0.68	885668.11	1358187.55	N 48 4 6.16	W 102 59 45.84
	1689.00	0.79	358.47	1688.89	-2.28	2.27	-13.56	0.25	885669.29	1358187.40	N 48 4 6.17	W 102 59 45.84
	1784.00	0.70	17.98	1783.89	-3.49	3.48	-13.39	0.28	885670.49	1358187.60	N 48 4 6.18	W 102 59 45.84
	1875.00	0.79	30.15	1874.88	-4.56	4.55	-12.91	0.20	885671.54	1358188.12	N 48 4 6.19	W 102 59 45.83
	1970.00	0.53	57.97	1969.87	-5.36	5.35	-12.21	0.43	885672.32	1358188.85	N 48 4 6.20	W 102 59 45.82
	2064.00	0.18	84.87	2063.87	-5.65	5.64	-11.70	0.37	885672.60	1358189.36	N 48 4 6.21	W 102 59 45.81
	2158.00	0.44	192.18	2157.87	-5.36	5.35	-11.65	0.60	885672.31	1358189.41	N 48 4 6.20	W 102 59 45.81
Last MWD Survey	2215.00	0.53	212.35	2214.87	-4.92	4.91	-11.83	0.34	885671.88	1358189.21	N 48 4 6.20	W 102 59 45.81

Survey Type: Def Survey

Survey Error Model: ISCWSA Rev 0 *** 3-D 95.000% Confidence 2.7955 sigma

Description	MD From (ft)	MD To (ft)	EOU Freq (ft)	Survey Tool Type	Borehole / Survey
	0.000	32.900	Act Sins	SLB_MWD-STD-Depth Only	Original Hole / Marlene Steffen 1-5-8H-141-97 MWD 0' to 2215'
	32.900	2215.000	Act Sins	SLB_MWD-STD	Original Hole / Marlene Steffen 1-5-8H-141-97 MWD 0' to 2215'



Weatherford®

Weatherford International Ltd.
2000 Oil Drive
Casper, WY 82604
Tel. 307-268-7900 Fax 307-235-3958

North Dakota Industrial Commission
Department of Mineral Resources
Oil & Gas Division
600 East Boulevard Avenue
Department 405
Bismarck, ND 58505-0840

Date: February 3, 2012

Attention: Rod Genrich

Re: OXY USA
MARLENE STEFFAN 1-5-8H-141-97
DUNN COUNTY, ND

Attached to this letter is a copy of the surveys taken by Precision Energy Services, a Weatherford International Ltd. company, MWD equipment on the subject well. The surveys from 2,356'MD to 21,091 MD represent, to the best of our knowledge, a true and accurate survey of the wellbore at the time the survey was run

Jose A Perez
Well Planning Department

Weatherford Drilling Services

Survey Report

Company:	OXY USA	Local Co-ordinate Reference:	Well MARLENE STEFFAN 1-5-8H-141-97
Project:	DUNN COUNTY, ND	TVD Reference:	WELL @ 2648.90ft (P-426)
Site:	MARLENE STEFFAN 1-5-8H-141-97	MD Reference:	WELL @ 2648.90ft (P-426)
Well:	MARLENE STEFFAN 1-5-8H-141-97	North Reference:	True
Wellbore:	MARLENE STEFFAN 1-5-8H-141-97	Survey Calculation Method:	Minimum Curvature
Design:	MARLENE STEFFAN 1-5-8H-141-97	Database:	EDM 2003.21 Single User Db

Project	DUNN 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	MARLENE STEFFAN 1-5-8H-141-97				
Site Position:		Northing:	34,984.04 ft	Latitude:	47° 4' 5.760 N
From:	Lat/Long	Easting:	1,346,523.34 ft	Longitude:	102° 59' 45.640 W
Position Uncertainty:	0.00 ft	Slot Radius:	"	Grid Convergence:	-1.86 °

Well	MARLENE STEFFAN 1-5-8H-141-97					
Well Position	+N/-S	0.00 ft	Northing:	34,984.04 ft	Latitude:	47° 4' 5.760 N
	+E/-W	0.00 ft	Easting:	1,346,523.34 ft	Longitude:	102° 59' 45.640 W
Position Uncertainty		0.00 ft	Wellhead Elevation:	ft	Ground Level:	2,618.00 ft

Wellbore	MARLENE STEFFAN 1-5-8H-141-97				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	BGGM2010	7/14/2011	8.27	72.47	56,341

Design	MARLENE STEFFAN 1-5-8H-141-97				
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 (°)	
	0.00	0.00	0.00	179.96	

Survey Program	Date	2/2/2012			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
2,356.00	21,151.00	WFT MWD Surveys (MARLENE STEFFAN 1-5-8H-141-97)	MWD	MWD - Standard	

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)	
TIE ON PT										
2,215.00	0.53	212.35	2,214.87	4.91	-11.83	-4.92	0.00	0.00	0.00	
FIRST WFT MWD SVY										
2,356.00	0.62	236.91	2,355.86	3.94	-12.82	-3.95	0.18	0.06	17.42	
2,451.00	0.61	234.00	2,450.86	3.36	-13.66	-3.38	0.03	-0.01	-3.06	
2,546.00	0.69	243.35	2,545.85	2.81	-14.58	-2.82	0.14	0.08	9.84	
2,641.00	0.63	258.52	2,640.85	2.45	-15.60	-2.46	0.19	-0.06	15.97	
2,736.00	0.58	271.81	2,735.84	2.36	-16.59	-2.37	0.16	-0.05	13.99	
2,830.00	0.44	257.05	2,829.84	2.30	-17.42	-2.31	0.20	-0.15	-15.70	
2,925.00	0.45	284.52	2,924.83	2.31	-18.14	-2.32	0.22	0.01	28.92	
3,020.00	0.43	281.70	3,019.83	2.47	-18.85	-2.49	0.03	-0.02	-2.97	
3,115.00	0.35	297.87	3,114.83	2.68	-19.45	-2.70	0.14	-0.08	17.02	
3,209.00	0.36	279.35	3,208.83	2.86	-20.00	-2.88	0.12	0.01	-19.70	

Weatherford Drilling Services

Survey Report

Company:	OXY USA	Local Co-ordinate Reference:	Well MARLENE STEFFAN 1-5-8H-141-97
Project:	DUNN COUNTY, ND	TVD Reference:	WELL @ 2648.90ft (P-426)
Site:	MARLENE STEFFAN 1-5-8H-141-97	MD Reference:	WELL @ 2648.90ft (P-426)
Well:	MARLENE STEFFAN 1-5-8H-141-97	North Reference:	True
Wellbore:	MARLENE STEFFAN 1-5-8H-141-97	Survey Calculation Method:	Minimum Curvature
Design:	MARLENE STEFFAN 1-5-8H-141-97	Database:	EDM 2003.21 Single User Db

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)
3,304.00	0.43	280.45	3,303.82	2.98	-20.64	-2.99	0.07	0.07	1.16
3,397.00	0.35	272.90	3,396.82	3.05	-21.27	-3.07	0.10	-0.09	-8.12
3,491.00	0.22	277.56	3,490.82	3.09	-21.74	-3.11	0.14	-0.14	4.96
3,586.00	0.16	356.34	3,585.82	3.25	-21.93	-3.27	0.26	-0.06	82.93
3,680.00	0.07	0.87	3,679.82	3.44	-21.93	-3.45	0.10	-0.10	4.82
3,775.00	0.25	103.97	3,774.82	3.45	-21.73	-3.46	0.29	0.19	108.53
3,870.00	0.36	109.30	3,869.82	3.30	-21.25	-3.31	0.12	0.12	5.61
3,965.00	0.49	126.03	3,964.82	2.96	-20.64	-2.98	0.19	0.14	17.61
4,060.00	0.35	101.44	4,059.81	2.66	-20.03	-2.68	0.24	-0.15	-25.88
4,155.00	0.43	106.73	4,154.81	2.50	-19.40	-2.52	0.09	0.08	5.57
4,250.00	0.36	98.07	4,249.81	2.36	-18.76	-2.37	0.10	-0.07	-9.12
4,344.00	0.49	99.87	4,343.81	2.25	-18.07	-2.26	0.14	0.14	1.91
4,439.00	0.43	120.56	4,438.80	2.00	-17.37	-2.01	0.18	-0.06	21.78
4,534.00	0.44	98.73	4,533.80	1.76	-16.70	-1.77	0.17	0.01	-22.98
4,629.00	0.56	100.35	4,628.80	1.62	-15.88	-1.63	0.13	0.13	1.71
4,723.00	0.58	96.59	4,722.79	1.48	-14.96	-1.50	0.05	0.02	-4.00
4,818.00	0.49	97.44	4,817.79	1.38	-14.08	-1.39	0.10	-0.09	0.89
4,912.00	0.56	113.25	4,911.78	1.14	-13.26	-1.15	0.17	0.07	16.82
5,007.00	0.56	121.56	5,006.78	0.72	-12.43	-0.73	0.09	0.00	8.75
5,101.00	0.41	119.92	5,100.78	0.31	-11.75	-0.32	0.16	-0.16	-1.74
5,195.00	0.38	126.71	5,194.77	-0.05	-11.21	0.04	0.06	-0.03	7.22
5,290.00	0.22	168.08	5,289.77	-0.41	-10.92	0.40	0.27	-0.17	43.55
5,383.00	0.22	190.65	5,382.77	-0.76	-10.92	0.75	0.09	0.00	24.27
5,478.00	0.72	169.35	5,477.77	-1.53	-10.84	1.52	0.55	0.53	-22.42
5,572.00	0.99	146.83	5,571.76	-2.79	-10.29	2.78	0.45	0.29	-23.96
5,667.00	0.75	152.38	5,666.75	-4.03	-9.55	4.02	0.27	-0.25	5.84
5,761.00	0.75	171.35	5,760.74	-5.18	-9.17	5.17	0.26	0.00	20.18
5,855.00	0.95	157.98	5,854.73	-6.51	-8.79	6.50	0.30	0.21	-14.22
5,950.00	0.97	160.19	5,949.72	-8.00	-8.22	7.99	0.04	0.02	2.33
6,044.00	1.07	170.04	6,043.70	-9.61	-7.80	9.60	0.21	0.11	10.48
6,139.00	0.99	169.85	6,138.69	-11.29	-7.50	11.29	0.08	-0.08	-0.20
6,234.00	0.88	163.43	6,233.67	-12.80	-7.15	12.79	0.16	-0.12	-6.76
6,328.00	1.13	178.50	6,327.66	-14.42	-6.92	14.41	0.38	0.27	16.03
6,423.00	1.05	162.48	6,422.64	-16.18	-6.63	16.18	0.33	-0.08	-16.86
6,518.00	1.05	165.99	6,517.63	-17.86	-6.16	17.85	0.07	0.00	3.69
6,612.00	1.25	171.42	6,611.61	-19.71	-5.80	19.70	0.24	0.21	5.78
6,707.00	1.04	180.66	6,706.59	-21.59	-5.65	21.59	0.29	-0.22	9.73
6,800.00	0.98	197.29	6,799.57	-23.20	-5.90	23.19	0.32	-0.06	17.88
6,895.00	0.85	229.96	6,894.56	-24.43	-6.68	24.42	0.56	-0.14	34.39
6,990.00	0.84	222.24	6,989.55	-25.40	-7.69	25.39	0.12	-0.01	-8.13
7,084.00	0.62	216.16	7,083.54	-26.32	-8.45	26.31	0.25	-0.23	-6.47
7,179.00	0.79	234.45	7,178.54	-27.11	-9.28	27.10	0.29	0.18	19.25
7,274.00	0.78	269.54	7,273.53	-27.50	-10.46	27.49	0.50	-0.01	36.94
7,369.00	0.53	286.50	7,368.52	-27.38	-11.53	27.37	0.33	-0.26	17.85
7,463.00	0.84	306.55	7,462.52	-26.84	-12.50	26.83	0.41	0.33	21.33
7,558.00	0.84	323.66	7,557.51	-25.87	-13.47	25.86	0.26	0.00	18.01
7,653.00	0.56	336.00	7,652.50	-24.88	-14.08	24.87	0.33	-0.29	12.99
7,748.00	0.45	42.41	7,747.50	-24.18	-14.01	24.17	0.59	-0.12	69.91
7,842.00	0.51	37.70	7,841.49	-23.58	-13.51	23.57	0.08	0.06	-5.01
7,937.00	0.49	34.30	7,936.49	-22.91	-13.02	22.90	0.04	-0.02	-3.58
8,032.00	0.56	36.07	8,031.49	-22.20	-12.52	22.19	0.08	0.07	1.86
8,126.00	0.36	22.06	8,125.48	-21.55	-12.14	21.55	0.24	-0.21	-14.90
8,221.00	0.38	27.86	8,220.48	-21.00	-11.88	20.99	0.04	0.02	6.11
8,315.00	0.29	25.26	8,314.48	-20.51	-11.63	20.50	0.10	-0.10	-2.77

Weatherford Drilling Services

Survey Report

Company:	OXY USA	Local Co-ordinate Reference:	Well MARLENE STEFFAN 1-5-8H-141-97
Project:	DUNN COUNTY, ND	TVD Reference:	WELL @ 2648.90ft (P-426)
Site:	MARLENE STEFFAN 1-5-8H-141-97	MD Reference:	WELL @ 2648.90ft (P-426)
Well:	MARLENE STEFFAN 1-5-8H-141-97	North Reference:	True
Wellbore:	MARLENE STEFFAN 1-5-8H-141-97	Survey Calculation Method:	Minimum Curvature
Design:	MARLENE STEFFAN 1-5-8H-141-97	Database:	EDM 2003.21 Single User Db

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)	
8,409.00	0.35	23.44	8,408.48	-20.03	-11.42	20.02	0.06	0.06	-1.94	
8,504.00	0.22	6.49	8,503.48	-19.58	-11.28	19.57	0.16	-0.14	-17.84	
8,599.00	0.16	4.10	8,598.48	-19.27	-11.25	19.26	0.06	-0.06	-2.52	
8,693.00	0.07	63.96	8,692.48	-19.11	-11.19	19.10	0.15	-0.10	63.68	
8,788.00	0.14	101.22	8,787.48	-19.11	-11.02	19.10	0.10	0.07	39.22	
8,883.00	0.14	347.97	8,882.47	-19.02	-10.93	19.01	0.25	0.00	-119.21	
8,978.00	0.45	180.05	8,977.47	-19.28	-10.96	19.27	0.62	0.33	-176.76	
9,073.00	0.62	161.02	9,072.47	-20.14	-10.79	20.13	0.26	0.18	-20.03	
9,167.00	0.43	138.70	9,166.47	-20.88	-10.39	20.88	0.29	-0.20	-23.74	
9,262.00	0.25	151.41	9,261.46	-21.33	-10.06	21.33	0.20	-0.19	13.38	
9,357.00	0.44	108.17	9,356.46	-21.63	-9.61	21.62	0.33	0.20	-45.52	
9,452.00	0.41	126.11	9,451.46	-21.94	-8.99	21.94	0.14	-0.03	18.88	
9,547.00	0.25	148.10	9,546.46	-22.32	-8.61	22.31	0.21	-0.17	23.15	
9,642.00	0.35	93.04	9,641.46	-22.51	-8.21	22.50	0.31	0.11	-57.96	
9,736.00	0.35	89.26	9,735.46	-22.52	-7.63	22.52	0.02	0.00	-4.02	
9,831.00	0.35	112.95	9,830.45	-22.63	-7.08	22.63	0.15	0.00	24.94	
9,926.00	0.14	119.41	9,925.45	-22.80	-6.71	22.80	0.22	-0.22	6.80	
10,021.00	0.22	128.53	10,020.45	-22.97	-6.46	22.97	0.09	0.08	9.60	
10,116.00	0.30	99.97	10,115.45	-23.13	-6.08	23.12	0.16	0.08	-30.06	
10,145.00	0.07	2.74	10,144.45	-23.13	-6.00	23.12	1.09	-0.79	-335.28	
10,204.00	3.26	187.35	10,203.42	-24.75	-6.21	24.75	5.64	5.41	-297.27	
10,236.00	5.75	194.89	10,235.32	-27.21	-6.74	27.20	7.98	7.78	23.56	
10,267.00	10.23	190.16	10,266.01	-31.42	-7.63	31.41	14.59	14.45	-15.26	
10,299.00	13.71	189.57	10,297.31	-37.96	-8.76	37.95	10.88	10.88	-1.84	
10,338.00	15.03	193.94	10,335.09	-47.42	-10.75	47.41	4.38	3.38	11.21	
10,370.00	14.43	198.33	10,366.04	-55.23	-13.00	55.22	3.96	-1.88	13.72	
10,401.00	16.47	194.17	10,395.92	-63.16	-15.29	63.15	7.49	6.58	-13.42	
10,433.00	20.08	190.04	10,426.30	-72.97	-17.36	72.96	11.98	11.28	-12.91	
10,465.00	23.27	186.07	10,456.04	-84.67	-18.99	84.66	10.97	9.97	-12.41	
10,496.00	25.51	185.35	10,484.27	-97.41	-20.26	97.39	7.29	7.23	-2.32	
10,528.00	28.87	186.30	10,512.73	-111.95	-21.75	111.94	10.59	10.50	2.97	
10,559.00	33.85	186.49	10,539.19	-127.98	-23.54	127.96	16.07	16.06	0.61	
10,591.00	38.31	186.23	10,565.05	-146.70	-25.63	146.68	13.95	13.94	-0.81	
10,622.00	41.02	183.82	10,588.91	-166.41	-27.35	166.39	10.05	8.74	-7.77	
10,654.00	44.00	182.97	10,612.50	-187.99	-28.63	187.97	9.48	9.31	-2.66	
10,686.00	47.58	182.52	10,634.81	-210.90	-29.72	210.88	11.23	11.19	-1.41	
10,717.00	50.65	180.78	10,655.09	-234.32	-30.39	234.30	10.77	9.90	-5.61	
10,748.00	55.26	179.15	10,673.77	-259.06	-30.36	259.04	15.45	14.87	-5.26	
10,780.00	59.83	179.21	10,690.93	-286.05	-29.98	286.03	14.28	14.28	0.19	
10,811.00	61.53	178.53	10,706.11	-313.07	-29.44	313.05	5.81	5.48	-2.19	
10,843.00	63.65	178.10	10,720.84	-341.47	-28.61	341.44	6.73	6.63	-1.34	
10,875.00	67.39	177.91	10,734.10	-370.57	-27.59	370.55	11.70	11.69	-0.59	
10,906.00	71.67	178.55	10,744.94	-399.59	-26.70	399.57	13.94	13.81	2.06	
10,938.00	73.65	178.61	10,754.48	-430.12	-25.94	430.10	6.19	6.19	0.19	
10,969.00	75.45	179.64	10,762.74	-460.00	-25.48	459.98	6.63	5.81	3.32	
11,001.00	78.40	181.72	10,769.98	-491.16	-25.86	491.14	11.18	9.22	6.50	
11,033.00	80.59	184.45	10,775.81	-522.57	-27.55	522.55	10.83	6.84	8.53	
11,064.00	82.15	184.83	10,780.46	-553.12	-30.03	553.10	5.18	5.03	1.23	
11,096.00	85.32	187.07	10,783.95	-584.75	-33.33	584.73	12.11	9.91	7.00	
11,110.00	86.71	187.82	10,784.93	-598.60	-35.14	598.57	11.28	9.93	5.36	
11,214.00	90.14	188.66	10,787.78	-701.47	-50.04	701.43	3.40	3.30	0.81	
11,246.00	90.21	188.75	10,787.69	-733.10	-54.88	733.06	0.36	0.22	0.28	
11,341.00	90.63	186.96	10,786.99	-827.21	-67.86	827.15	1.94	0.44	-1.88	
11,435.00	91.19	184.59	10,785.50	-920.71	-77.32	920.65	2.59	0.60	-2.52	

Weatherford Drilling Services

Survey Report

Company:	OXY USA	Local Co-ordinate Reference:	Well MARLENE STEFFAN 1-5-8H-141-97
Project:	DUNN COUNTY, ND	TVD Reference:	WELL @ 2648.90ft (P-426)
Site:	MARLENE STEFFAN 1-5-8H-141-97	MD Reference:	WELL @ 2648.90ft (P-426)
Well:	MARLENE STEFFAN 1-5-8H-141-97	North Reference:	True
Wellbore:	MARLENE STEFFAN 1-5-8H-141-97	Survey Calculation Method:	Minimum Curvature
Design:	MARLENE STEFFAN 1-5-8H-141-97	Database:	EDM 2003.21 Single User Db

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)
11,530.00	91.12	183.40	10,783.58	-1,015.46	-83.94	1,015.39	1.25	-0.07	-1.25
11,624.00	90.56	181.82	10,782.20	-1,109.35	-88.22	1,109.28	1.78	-0.60	-1.68
11,719.00	90.35	181.18	10,781.45	-1,204.31	-90.71	1,204.24	0.71	-0.22	-0.67
11,814.00	90.14	180.89	10,781.04	-1,299.29	-92.42	1,299.22	0.38	-0.22	-0.31
11,909.00	90.42	181.67	10,780.58	-1,394.27	-94.54	1,394.19	0.87	0.29	0.82
12,004.00	90.63	181.26	10,779.71	-1,489.23	-96.97	1,489.16	0.48	0.22	-0.43
12,099.00	89.93	181.51	10,779.24	-1,584.20	-99.27	1,584.13	0.78	-0.74	0.26
12,193.00	89.30	180.87	10,779.88	-1,678.18	-101.22	1,678.10	0.96	-0.67	-0.68
12,288.00	90.07	180.02	10,780.40	-1,773.17	-101.96	1,773.09	1.21	0.81	-0.89
12,383.00	89.30	179.41	10,780.92	-1,868.17	-101.49	1,868.09	1.03	-0.81	-0.64
12,478.00	91.05	178.45	10,780.63	-1,963.15	-99.71	1,963.07	2.10	1.84	-1.01
12,573.00	90.84	178.01	10,779.06	-2,058.09	-96.78	2,058.01	0.51	-0.22	-0.46
12,668.00	90.49	177.00	10,777.96	-2,152.99	-92.64	2,152.92	1.13	-0.37	-1.06
12,762.00	89.79	177.24	10,777.73	-2,246.87	-87.92	2,246.80	0.79	-0.74	0.26
12,857.00	91.47	177.87	10,776.69	-2,341.78	-83.87	2,341.71	1.89	1.77	0.66
12,952.00	91.12	177.72	10,774.54	-2,436.68	-80.21	2,436.62	0.40	-0.37	-0.16
13,047.00	91.05	177.46	10,772.74	-2,531.58	-76.22	2,531.52	0.28	-0.07	-0.27
13,142.00	90.70	176.59	10,771.29	-2,626.44	-71.29	2,626.38	0.99	-0.37	-0.92
13,237.00	90.07	177.79	10,770.65	-2,721.32	-66.63	2,721.27	1.43	-0.66	1.26
13,332.00	89.86	177.97	10,770.71	-2,816.26	-63.12	2,816.21	0.29	-0.22	0.19
13,427.00	90.00	177.65	10,770.83	-2,911.19	-59.49	2,911.14	0.37	0.15	-0.34
13,522.00	89.44	177.89	10,771.29	-3,006.11	-55.79	3,006.07	0.64	-0.59	0.25
13,616.00	89.44	177.99	10,772.21	-3,100.05	-52.41	3,100.01	0.11	0.00	0.11
13,711.00	90.14	177.71	10,772.56	-3,194.98	-48.85	3,194.94	0.79	0.74	-0.29
13,806.00	90.63	178.50	10,771.92	-3,289.93	-45.71	3,289.89	0.98	0.52	0.83
13,901.00	90.42	178.83	10,771.05	-3,384.90	-43.49	3,384.86	0.41	-0.22	0.35
13,996.00	90.21	179.24	10,770.53	-3,479.88	-41.89	3,479.85	0.48	-0.22	0.43
14,091.00	90.07	179.17	10,770.29	-3,574.87	-40.58	3,574.84	0.16	-0.15	-0.07
14,186.00	90.21	180.51	10,770.06	-3,669.87	-40.31	3,669.84	1.42	0.15	1.41
14,280.00	90.91	181.05	10,769.14	-3,763.85	-41.59	3,763.82	0.94	0.74	0.57
14,375.00	90.00	180.93	10,768.39	-3,858.84	-43.23	3,858.80	0.97	-0.96	-0.13
14,470.00	90.21	180.25	10,768.21	-3,953.83	-44.21	3,953.79	0.75	0.22	-0.72
14,564.00	90.42	179.98	10,767.70	-4,047.83	-44.40	4,047.79	0.36	0.22	-0.29
14,659.00	89.09	179.33	10,768.10	-4,142.82	-43.83	4,142.79	1.56	-1.40	-0.68
14,754.00	89.65	179.41	10,769.15	-4,237.81	-42.78	4,237.78	0.60	0.59	0.08
14,849.00	90.77	178.58	10,768.80	-4,332.79	-41.12	4,332.76	1.47	1.18	-0.87
14,944.00	90.28	178.66	10,767.93	-4,427.76	-38.83	4,427.73	0.52	-0.52	0.08
15,039.00	90.21	178.32	10,767.52	-4,522.73	-36.32	4,522.70	0.37	-0.07	-0.36
15,134.00	90.63	178.00	10,766.83	-4,617.68	-33.27	4,617.65	0.56	0.44	-0.34
15,228.00	90.56	178.32	10,765.85	-4,711.62	-30.26	4,711.60	0.35	-0.07	0.34
15,323.00	89.23	177.97	10,766.03	-4,806.57	-27.18	4,806.55	1.45	-1.40	-0.37
15,417.00	90.91	178.21	10,765.91	-4,900.51	-24.05	4,900.49	1.81	1.79	0.26
15,512.00	90.21	177.89	10,764.98	-4,995.45	-20.82	4,995.44	0.81	-0.74	-0.34
15,606.00	89.93	177.61	10,764.87	-5,089.38	-17.13	5,089.37	0.42	-0.30	-0.30
15,701.00	90.21	177.72	10,764.75	-5,184.30	-13.25	5,184.29	0.32	0.29	0.12
15,819.00	90.00	178.04	10,764.54	-5,302.22	-8.89	5,302.21	0.32	-0.18	0.27
15,914.00	90.28	177.32	10,764.30	-5,397.14	-5.04	5,397.14	0.81	0.29	-0.76
16,009.00	90.84	178.40	10,763.37	-5,492.07	-1.50	5,492.07	1.28	0.59	1.14
16,105.00	91.19	178.15	10,761.67	-5,588.01	1.39	5,588.01	0.45	0.36	-0.26
16,200.00	90.98	178.49	10,759.87	-5,682.95	4.18	5,682.95	0.42	-0.22	0.36
16,296.00	90.98	179.78	10,758.23	-5,778.93	5.63	5,778.93	1.34	0.00	1.34
16,391.00	91.61	180.97	10,756.09	-5,873.90	5.00	5,873.90	1.42	0.66	1.25
16,486.00	91.05	180.26	10,753.88	-5,968.87	3.99	5,968.87	0.95	-0.59	-0.75
16,581.00	90.56	179.58	10,752.55	-6,063.85	4.12	6,063.86	0.88	-0.52	-0.72

Weatherford Drilling Services

Survey Report

Company:	OXY USA	Local Co-ordinate Reference:	Well MARLENE STEFFAN 1-5-8H-141-97
Project:	DUNN COUNTY, ND	TVD Reference:	WELL @ 2648.90ft (P-426)
Site:	MARLENE STEFFAN 1-5-8H-141-97	MD Reference:	WELL @ 2648.90ft (P-426)
Well:	MARLENE STEFFAN 1-5-8H-141-97	North Reference:	True
Wellbore:	MARLENE STEFFAN 1-5-8H-141-97	Survey Calculation Method:	Minimum Curvature
Design:	MARLENE STEFFAN 1-5-8H-141-97	Database:	EDM 2003.21 Single User Db

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)
16,676.00	90.28	180.25	10,751.85	-6,158.85	4.26	6,158.85	0.76	-0.29	0.71
16,772.00	89.93	180.22	10,751.67	-6,254.85	3.87	6,254.85	0.37	-0.36	-0.03
16,867.00	89.72	179.29	10,751.96	-6,349.85	4.27	6,349.85	1.00	-0.22	-0.98
16,962.00	89.30	179.26	10,752.78	-6,444.84	5.47	6,444.84	0.44	-0.44	-0.03
17,057.00	90.00	179.10	10,753.36	-6,539.82	6.83	6,539.83	0.76	0.74	-0.17
17,151.00	89.72	179.07	10,753.59	-6,633.81	8.33	6,633.82	0.30	-0.30	-0.03
17,246.00	90.14	179.52	10,753.70	-6,728.80	9.50	6,728.81	0.65	0.44	0.47
17,341.00	90.49	178.93	10,753.18	-6,823.79	10.79	6,823.80	0.72	0.37	-0.62
17,436.00	90.56	178.97	10,752.31	-6,918.77	12.53	6,918.78	0.08	0.07	0.04
17,530.00	90.91	178.81	10,751.10	-7,012.75	14.35	7,012.76	0.41	0.37	-0.17
17,625.00	90.84	177.93	10,749.65	-7,107.70	17.05	7,107.71	0.93	-0.07	-0.93
17,720.00	90.35	177.33	10,748.67	-7,202.61	20.98	7,202.62	0.82	-0.52	-0.63
17,815.00	90.21	177.65	10,748.20	-7,297.52	25.14	7,297.54	0.37	-0.15	0.34
17,910.00	90.56	179.13	10,747.56	-7,392.48	27.81	7,392.50	1.60	0.37	1.56
18,005.00	90.07	179.67	10,747.04	-7,487.47	28.80	7,487.49	0.77	-0.52	0.57
18,100.00	90.07	179.65	10,746.93	-7,582.47	29.37	7,582.49	0.02	0.00	-0.02
18,195.00	90.00	179.81	10,746.87	-7,677.47	29.82	7,677.49	0.18	-0.07	0.17
18,290.00	89.93	179.54	10,746.93	-7,772.46	30.35	7,772.49	0.29	-0.07	-0.28
18,384.00	89.86	178.84	10,747.10	-7,866.45	31.68	7,866.48	0.75	-0.07	-0.74
18,479.00	90.56	179.93	10,746.75	-7,961.45	32.70	7,961.47	1.36	0.74	1.15
18,573.00	90.56	180.43	10,745.83	-8,055.44	32.41	8,055.46	0.53	0.00	0.53
18,668.00	90.56	180.20	10,744.90	-8,150.43	31.89	8,150.46	0.24	0.00	-0.24
18,763.00	90.28	180.37	10,744.21	-8,245.43	31.41	8,245.45	0.34	-0.29	0.18
18,857.00	89.86	179.65	10,744.09	-8,339.43	31.40	8,339.45	0.89	-0.45	-0.77
18,952.00	90.07	180.64	10,744.15	-8,434.43	31.16	8,434.45	1.07	0.22	1.04
19,046.00	89.51	181.50	10,744.49	-8,528.41	29.40	8,528.43	1.09	-0.60	0.91
19,140.00	89.79	181.14	10,745.07	-8,622.38	27.24	8,622.40	0.49	0.30	-0.38
19,235.00	90.14	180.69	10,745.13	-8,717.37	25.72	8,717.39	0.60	0.37	-0.47
19,330.00	90.56	180.14	10,744.55	-8,812.37	25.03	8,812.38	0.73	0.44	-0.58
19,425.00	91.82	180.43	10,742.57	-8,907.34	24.56	8,907.36	1.36	1.33	0.31
19,519.00	88.95	180.36	10,741.94	-9,001.33	23.91	9,001.34	3.05	-3.05	-0.07
19,614.00	89.65	180.38	10,743.10	-9,096.32	23.30	9,096.33	0.74	0.74	0.02
19,709.00	89.51	179.36	10,743.80	-9,191.31	23.51	9,191.33	1.08	-0.15	-1.07
19,805.00	90.00	179.22	10,744.21	-9,287.31	24.70	9,287.32	0.53	0.51	-0.15
19,901.00	89.65	177.96	10,744.50	-9,383.27	27.06	9,383.29	1.36	-0.36	-1.31
19,996.00	90.28	178.51	10,744.56	-9,478.23	29.99	9,478.25	0.88	0.66	0.58
20,091.00	91.19	178.76	10,743.34	-9,573.19	32.25	9,573.21	0.99	0.96	0.26
20,185.00	91.33	179.21	10,741.27	-9,667.15	33.92	9,667.18	0.50	0.15	0.48
20,281.00	91.19	178.54	10,739.16	-9,763.11	35.80	9,763.14	0.71	-0.15	-0.70
20,376.00	90.63	177.66	10,737.65	-9,858.05	38.95	9,858.07	1.10	-0.59	-0.93
20,470.00	90.14	177.46	10,737.02	-9,951.96	42.95	9,951.99	0.56	-0.52	-0.21
20,565.00	89.86	177.72	10,737.02	-10,046.87	46.95	10,046.91	0.40	-0.29	0.27
20,660.00	90.28	177.91	10,736.91	-10,141.81	50.57	10,141.84	0.49	0.44	0.20
20,755.00	90.07	177.34	10,736.62	-10,236.72	54.51	10,236.76	0.64	-0.22	-0.60
20,850.00	90.28	176.80	10,736.33	-10,331.60	59.36	10,331.64	0.61	0.22	-0.57
20,945.00	90.98	176.62	10,735.28	-10,426.43	64.81	10,426.48	0.76	0.74	-0.19
21,040.00	91.40	175.97	10,733.31	-10,521.22	70.95	10,521.27	0.81	0.44	-0.68
LAST WFT MWD SVY									
21,091.00	90.84	175.63	10,732.31	-10,572.07	74.69	10,572.12	1.28	-1.10	-0.67
STRAIGHT LINE PROJ TO TD									
21,151.00	90.84	175.63	10,731.43	-10,631.89	79.26	10,631.95	0.00	0.00	0.00

Weatherford Drilling Services

Survey Report

Company:	OXY USA	Local Co-ordinate Reference:	Well MARLENE STEFFAN 1-5-8H-141-97
Project:	DUNN COUNTY, ND	TVD Reference:	WELL @ 2648.90ft (P-426)
Site:	MARLENE STEFFAN 1-5-8H-141-97	MD Reference:	WELL @ 2648.90ft (P-426)
Well:	MARLENE STEFFAN 1-5-8H-141-97	North Reference:	True
Wellbore:	MARLENE STEFFAN 1-5-8H-141-97	Survey Calculation Method:	Minimum Curvature
Design:	MARLENE STEFFAN 1-5-8H-141-97	Database:	EDM 2003.21 Single User Db

Survey Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
2,215.00	2,214.87	4.91	-11.83	TIE ON PT
2,356.00	2,355.86	3.94	-12.82	FIRST WFT MWD SVY
21,091.00	10,732.31	-10,572.07	74.69	LAST WFT MWD SVY
21,151.00	10,731.78	-10,631.87	79.47	STRAIGHT LINE PROJ TO TD

Checked By: _____	Approved By: _____	Date: _____
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SUNDRY NOTICES AND REPORTS ON WELLS - FORM 54

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.

20749

AA

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	☐ 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	Request Confidentiality

Well Name and Number Marlene Steffan 1-5-8H-141-97					
Footages	Qtr-Qtr	Section	Township	Range	
310 F S L 1420 F W L	SESE	32	142 N	97 W	
Field	Pool	County			
St. Anthony	Three Forks	Dunn			

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

OXY USA Inc. requests confidentiality for this well completion.

Ends

06-01-2012

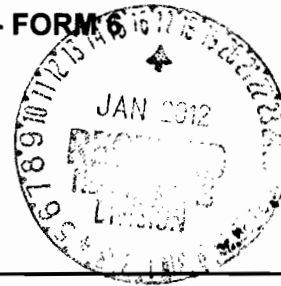
Company OXY USA Inc.		Telephone Number (713) 366-5303	
Address P.O. Box 27757			
City Houston	State TX	Zip Code 77227-7757	
Signature <i>Shelia Kennedy</i>	Printed Name Shelia Kennedy		
Title Contract Regulatory Analyst	Date <i>1/9/12</i>		
Email Address Shelia_Kennedy@oxy.com			

FOR STATE USE ONLY	
☐ Received	☒ Approved
Date <i>1-18-2012</i>	
By <i>David Tubert</i>	
Title Engineering Technician	



WELL COMPLETION OR RECOMPLETION REPORT - FORM 6

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



Well File No.
20749



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 Marlene Steffan 1-5-8H-141-97			Spacing Unit Description Secs. 5 & 8 141N 97W		
Operator OXY USA Inc.		Telephone Number 713-366-5303		Field St. Anthony	
Address P.O. Box 27757			Pool Three Forks <i>Bakken</i>		
City Houston	State TX	Zip Code 77227-7757	Permit Type ☐ Wildcat ☒ Development ☐ Extension		

LOCATION OF WELL

At Surface 310 F S L 1420 F W L	Qtr-Qtr SESE	Section 32	Township 142 N	Range 97 W	County Dunn
Spud Date 7/12/2011	Date TD Reached 9/18/2011	Drilling Contractor and Rig Number Precision 426	KB Elevation (Ft) 2651	Graded Elevation (Ft) 2618	
Type of Electric and Other Logs Run (See Instructions) Array Induction Resistivity, Density/Neutron/PEF, DSI, GR, CBL					

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

Well Bore	String Type	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		2256	13 1/2	36			628	0
Vertical Hole	Intermediate	7		11161	8 3/4	26/32			738	1800
Lateral1	Liner	4 1/2	10935	21101	6	11.6			0	

PERFORATION & OPEN HOLE INTERVALS

Well Bore	Well Bore TD Drillers Depth (MD Ft)	Completion Type	Open Hole/Perforated Interval (MD,Ft)		Kick-off Point (MD Ft)	Top of Casing Window (MD Ft)	Date Perf'd or Drilled	Date Isolated	Isolation Method	Sacks Cement
Lateral1	21151	Open Hole	11161	21151	10216		08/14/2011			

PRODUCTION

Current Producing Open Hole or Perforated Interval(s), This Completion, Top and Bottom, (MD Ft) 11160' - 21151' Open Hole						Name of Zone (If Different from Pool Name) <i>Three Forks</i>			
Date Well Completed (SEE INSTRUCTIONS) 12/01/2011		Producing Method Flowing		Pumping-Size & Type of Pump N/A		Well Status (Producing or Shut-In) Producing			
Date of Test 12/01/2011	Hours Tested 24	Choke Size 22 /64	Production for Test	Oil (Bbls) 101	Gas (MCF) 0	Water (Bbls) 0	Oil Gravity-API (Corr.) 42.0 °	Disposition of Gas Flared	
Flowing Tubing Pressure (PSI) N/A		Flowing Casing Pressure (PSI) 350		Calculated 24-Hour Rate	Oil (Bbls) 101	Gas (MCF) 0	Water (Bbls) 0	Gas-Oil Ratio 0	

orig

GEOLOGICAL MARKERS

Formation	MD (Ft)	TVD (Ft)
Hell Creek	1476	1476
Fox Hills	1762	1762
Pierre Shale	2261	2261
Niobrara	4240	4240
Greenhorn	4811	4811
Mowry	5292	5292
Dakota	5685	5685
Morrison	5990	5990
Rierdon	6534	6534
Dunham Salt	6879	6879
Spearfish	6968	6968
Pine Salt	7118	7118
Minnekahta	7389	7389
Opeche Salt	7472	7471
Minnelusa	7723	7723
Amsden	7946	7945
Tyler	8280	8280
Kibbey Lime	8771	8771
Charles Mad./First Salt	8909	8908
Greenpoint Anhydrite	9196	9196
Base Last Salt	9285	9285
Mission Canyon	9456	9456
Fryburg Interval	9632	9632
Lodgepole	9947	9947
False Bakken	10794	10698
Scallion	10858	10727
Up. Bakken/Mid. Bakken	10885	10738
Three Forks	10969	10763

PLUG BACK INFORMATION

[illegible]

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								
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 10/20/2011	Stimulated Formation Three Forks	Top (Ft) 11179	Bottom (Ft) 20960	Stimulation Stages 35	Volume 120603	Volume Units Barrels
Type Treatment Sand Frac	Acid % 0	Lbs Proppant 1266960	Maximum Treatment Pressure (PSI) 7578		Maximum Treatment Rate (BBLS/Min) 39.1	
Details List of frac intervals attached						

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						

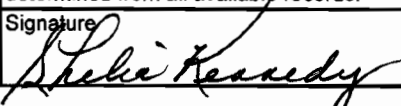
Date Stimulated	Stimulated Formation	Top (Ft)	Bottom (Ft)	Stimulation Stages	Volume	Volume Units
Type Treatment	Acid %	Lbs Proppant	Maximum Treatment Pressure (PSI)		Maximum Treatment Rate (BBLS/Min)	
Details						

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

List of frac intervals, Form 4 Request for Confidentiality

I hereby swear or affirm that the information provided is true, complete and correct as determined from all available records.		Email Address Shelia_Kennedy@oxy.com	Date 01/09/2012
Signature 	Printed Name Shelia Kennedy	Title Contract Regulatory Analyst	

MARLENE STEFFAN 1-5-8H-141-97
FRAC INTERVALS

Frac Stage	Top interval	Bottom interval	Interval length
	MD (Ft)	MD (Ft)	Ft
1	20822	20960	138
2	20550	20822	272
3	20281	20550	269
4	20009	20281	272
5	19738	20009	271
6	19465	19738	273
7	19196	19465	269
8	18925	19196	271
9	18653	18925	272
10	18384	18653	269
11	18112	18384	272
12	17839	18112	273
13	17564	17839	275
14	17291	17564	273
15	17019	17291	272
16	16746	17019	273
17	16458	16746	288
18	16165	16458	293
19	15869	16165	296
20	15574	15869	295
21	15262	15574	312
22	14987	15262	275
23	14692	14987	295
24	14403	14692	289
25	14108	14403	295
26	13812	14108	296
27	13518	13812	294
28	13222	13518	296
29	12926	13222	296
30	12630	12926	296
31	12336	12630	294
32	12041	12336	295
33	11745	12041	296
34	11454	11745	291
35	11179	11454	275



AUTHORIZATION TO PURCHASE AND TRANSPORT OIL FROM LEASE - FORM 8

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



Well File No. 20749
NDIC CTB No. 120749

PLEASE READ INSTRUCTIONS BEFORE FILLING OUT FORM.

PLEASE SUBMIT THE ORIGINAL AND FOUR COPIES.

Well Name and Number MARLENE STEFFAN 1-5-8H-141-97	Qtr-Qtr SWSE	Section 32	Township 142 N	Range 97 W	County Dunn
Operator OXY USA Inc.	Telephone Number (713) 366-5303	Field St. Anthony			
Address PO Box 27757	City Houston	State TX	Zip Code 77227-7757		

Name of First Purchaser Eighty-Eight Oil LLC	Telephone Number (307) 266-0426	% Purchased 100	Date Effective October 15, 2011	
Principal Place of Business PO Drawer 2360	City Casper	State WY	Zip Code 82602	
Field Address 10008 58th St. W.	City Williston	State ND	Zip Code 58801	
Name of Transporter Black Hills Trucking	Telephone Number (701) 225-6881	% Transported 100	Date Effective October 15, 2011	
Address 125 GTA Drive	City Dickinson	State ND	Zip Code 58602-0250	

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

Other First Purchasers Purchasing From This Lease	% Purchased	Date Effective
Other First Purchasers Purchasing From This Lease	% Purchased	Date Effective
Other Transporters Transporting From This Lease	% Transported	Date Effective
Other Transporters Transporting From This Lease	% Transported	Date Effective
Comments		

I hereby swear or affirm that the information provided is true, complete and correct as determined from all available records.		Date 10/26/11
Signature 	Printed Name Elizabeth S. Bush-Ivie	Title Sr. Regulatory Advisor

Above Signature Witnessed By		
Witness Signature 	Witness Printed Name Shelia Kennedy	Witness Title Regulatory Analyst

FOR STATE USE ONLY

Date Approved DEC 08 2011
By
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
20749

Tight Hole **No**

OPERATOR

Operator OXY USA INC.	Representative Ron Miller	Rep Phone (701) 264-4126
---------------------------------	-------------------------------------	------------------------------------

WELL INFORMATION

Well Name MARLENE STEFFAN 1-5-8H-141-97	Inspector Rick Hutchens
Well Location QQ Sec Twp Rng SWSE 32 142 N 97 W	County DUNN
Footages 310 Feet From the S Line	Field ST. ANTHONY
1420 Feet From the E Line	Pool BAKKEN
Date of First Production Through Permanent Wellhead 12/1/2011	This Is The First Sales

PURCHASER / TRANSPORTER

Purchaser EIGHTY-EIGHT OIL LLC	Transporter BLACK HILLS TRUCKING
--	--

TANK BATTERY

Unit Tank Battery Number :

SALES INFORMATION This Is The First Sales

ESTIMATED BARRELS TO BE SOLD	ACTUAL BARRELS SOLD	DATE
BBLs	BBLs	
BBLs	BBLs	
BBLs	BBLs	
BBLs	BBLs	
BBLs	BBLs	
BBLs	BBLs	
BBLs	BBLs	
BBLs	BBLs	
BBLs	BBLs	

DETAILS

Awaiting Sales

Start Date **12/2/2011**
Date Approved **12/2/2011**
Approved By **Nicole Anderson**



Oil and Gas Division

20749

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

November 30, 2011

ELIZABETH BUSH-IVIE
OXY USA INC
Mid-Continent Business Unit, 5 Greenway Plaza, Suite 110
HOUSTON, TX 77046

RE: MARLENE STEFFAN 1-5-8H-141-97
SWSE 32-142N-97W
DUNN COUNTY
WELL FILE NO. 20749

Dear Elizabeth:

After review of the Cement Bond Log submitted on the above referenced well, dated October 2, 2011, we have determined that the top of cement behind the 7" casing string is at a depth of 7136 feet. The top of the CRETACEOUS-INYAN KARA Formation within the Dakota Group is picked from logs at 5658 feet. The North Dakota Administrative Code Section 43-02-03-21 requires that sufficient cement be used to isolate the Dakota Group of which the CRETACEOUS-INYAN KARA Formation is a part. Since the Dakota Group is not properly isolated, approval may be granted to monitor the surface-production casing annulus, in lieu of an immediate cement squeeze, contingent upon the following stipulations:

1. The surface-production casing annulus must be continuously monitored with an accurate pressure gauge.
2. The pressure gauge must not be any higher than a 300 psi gauge.
3. All valves installed on the annulus must be exposed to the surface; burial will be allowed only in the presence of an Oil and Gas Division inspector.
4. Any pressure development on the annulus must be immediately reported to the Oil and Gas Division
5. The CRETACEOUS-INYAN KARA Formation must be isolated, as directed by the Oil and Gas Division, upon the abandonment of the well
6. Remedial action may be required prior to abandonment if warranted by the Director

If you have any questions, do not hesitate to contact me.

Sincerely,


Richard A. Suggs
Geologist

rwh/ras

20749



Oxy USA

Marlene Steffan 1-5-8H-141-97

**Section 32 T142N R97W
Dunn County, North Dakota**

*Austin Onipe,
Wellsite Geologist*

NCS **NESET**
CONSULTING
SERVICE

117 North Welo Street PO Box 730 Tioga ND, 58852 701-664-1492

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WELL SUMMARY

OPERATOR:	Oxy USA, INC	
LEASE:	Marlen Steffan 1-5-8H-141-97	
API WELL #	33-025-01358000	
LOCATION:	Field:	St. Anthony
	Footage:	310' FSL & 1,420' FEL
	Legal:	Section 32 T142N R97W
	Bottom hole:	234.87' FSL & 1,345.31' FEL
	Legal:	Section 8 T141N R97W
	County:	Dunn County, North Dakota
ELEVATION:	Kelly Bushing:	2,650'
	Ground Level:	2,618'
SPUD DATE:	July 27, 2011	
CEASE DRILLING:	September 10, 2011	
TOTAL DEPTH:	21,151' MD 10,731.78'TVD 10,631.93' VS	
CONTRACTOR:	Rig:	Precision Drilling Company, LP
	Toolpusher:	Mark Yhard, Mark Jones
	Drillers:	Cody Deutsch, Bryce Murray
CASING RECORD:	Surface:	9 5/8" casing to at 6,635'
	Intermediate:	5 1/2" casing set to 11,161'
MUD RECORD:	Mud company:	Newpark Drilling Fluids, L.L.C.
	Mud engineer:	Nick Latham, Steve Brown
	Mud up depth:	5,000'
	Mud type:	Invert, Oil Based Mud
DIRECTIONAL DRILLING PROGRAM:	Directional company:	Weatherford International
	Directional drillers:	Shawn Boyles, Jeff Novotny
	MWD company:	Weatherford International
	MWD supervisors:	Clint Komers, Clae Bilek
MUDLOGGING PROGRAM:	Mud logging company:	Neset Consulting Service
	Mudloggers:	Austin Onipe, Thomas Haase
	Services:	NCS Total Gas & Chromatograph

SAMPLE PROGRAM: Caught: 10', 30', 50'
Examined: All
Saved: All
Quality: Good to excellent

LOGGING PROGRAM: None

WELL STATUS: Awaiting Completion

COMPANY ENGINEER: Pierre Castro

WELLSITE SUPERVISOR: Allen Marco, Roy Conrad, Jimmy Hileman

COMPANY GEOLOGIST: Dale A Walker

WELLSITE GEOLOGIST: Austin Onipe

GEOLOGIC SUMMARY

OXY USA INC Marlene Steffan 1-5-8H-141-97 was drilled as a single lateral horizontal oil well, cutting diagonally across one section, targeting the Three Forks Siltstone. It was located in the SWSE Section 32 T142N R97W, Dunn County, North Dakota.

The Marlene Steffan 1-5-8H-141-97 was spudded on July 27, 2011. Well site geological services consisted of a two person mud-logging team from a depth of 8,000' ft in the Kibbey Limestone formation until the end of the well. A Total Gas Detection computerized gas detector with chromatograph was used for gas detection. Two sets of lagged samples in ten, twenty, and thirty foot intervals were caught and saved to be archived. Lateral one reached a total measured depth of 21,151 ft on September 10, 2011, 48 days after spud.

Vertical **8,000' – 11,171' MD**

Mudlogging began in the Tyler formation at a depth of 8,000' ft. Total Gas Detection was utilized for monitoring gas. Logging services began on August 6, 2011. The Kibbey Limestone consisted of scattered limestone and anhydrite. The Minnelusa formation consisted of shale. The rate of penetration averaged around 40 – 60 ft/hr in the shale and anhydrite. Background gases in the Minnelusa read very low between 11 – 17 units.

Kibbey Limestone **8,748' MD** **8,747' TVD** **-6,097' SS**

The Kibbey Formation was encountered at a measured depth of 8,748' ft. The samples composed of Dolomite, It was light medium gray to gray, microcrystalline, argillaceous, moderate induration, calcareous, fair amount of sandstone, 20% Anhydrite interbedding, white, light grey, chalky, moderate to poor induration, poor intercrystalline porosity, even spotted fluorescence, dull streaming cut.

Charles Salt **8,904' MD** **8,903' TVD** **-6,253' SS**

The Charles Salt was encountered at a measured depth of 8,904', two feet high of prognosis. The Charles consisted of scattered limestone, anhydrite, and salt benches. The penetration rates averaged around 30-45 ft/hr through the limestone. While drilling through the salts, penetration rates increased to around 50 – 65 ft/hr with the samples showing a salt, limestone, and anhydrite mixture. Background gases throughout the Charles read very low.

Mission Canyon: ***9,456' MD*** ***9,455' TVD*** ***-6,805' SS***

The Mission Canyon was encountered at a measured depth of 9,456', four feet high of prognosis. The Mission Canyon formation was chosen from a lithology change from limestone, anhydrite, and dolomite. The penetration rates averaged around 50 – 70 ft/hr. It was very fine to fine crystalline, and had a sucrosic texture, with minor dark brown staining. The samples were limey in part, with poor intercrystalline porosity. The fluorescence was trace spotty, with a slow to moderate cloudy cut. The samples changed to limestone, with a mudstone to wackestone sample size. The limestone was dolomitic and argillaceous, to clean in part, with poor to fair induration. The intergranular porosity was poor to fair. The limestone showed trace fluorescence, with weak streaming cuts, milky cuts, and bright instant cuts.

Lodgepole ***9,947' MD*** ***9,946' TVD*** ***-7,296' SS***

The Lodgepole was encountered at a measured depth of 9,947', six feet low of prognosis. It was composed of medium to light gray limestone. It had a wackestone grain size and was argillaceous to clean in part, with moderate induration. Scattered brown staining and chert were seen in some samples. The intergranular porosity was poor to fair. Most samples showed even very dull yellow, green fluorescence, cloudy, milky, weak instant streaming cuts.

Upper Bakken Shale ***10,885' MD*** ***10,738' TVD*** ***-8,088' SS***

The Bakken Shale was encountered at a measured depth of 10,885'. The shale was brownish black, with a slightly silty appearance. It was firm, slightly calcareous and subblocky to blocky. Occasional micro-pyrite was seen in the samples. The shale had no fluorescence and a fast streaming yellow cut, which dried to a good yellow gold halo. Under white light, the solvent gradually turned a strong amber color and dried to a good yellow brown oil ring. The background gas increased from 101 units to more than 150 units.

Middle Bakken ***10,910' MD*** ***10,746' TVD*** ***-8,096' SS***

The Middle Bakken was encountered at a TVD of 10,910' ft. The samples were composed of grainstone to packestone limestone. After placing chips in acid, 90%+ dissolved leaving abundant silty to lower very fine sandy insoluble residue. The limestone had poor to moderate induration, with fair to poor intergranular porosity. The fluorescence was even light yellow, with a moderate streaming cut. Background gas while drilling in the Bakken Siltstone was near 80 – 90 units of total gas.

Three Forks

10,969' MD

10,762' TVD

-8,112' SS

The Three Forks was encountered at a TVD of 10,762' ft. The samples were composed of red, tan to brown, white, gray laminations, firm hard, brittle, subrounded, blocky, platy, sub angular, microcrystalline, argillaceous, carbonaceous, argillaceous, interbedded, calcareous, trace some shale's, scattered yellow fluorescence, slow pinpoint streaming cut. Background gas while drilling in the Three Forks was between 90-165 units.

Curve

After picking up directional tools for KOP at 10,180' MD, Drilling times in the Lodgepole below KOP were between 1.2 – 4.0 min/ft rotating and 2.5 – 4.0 min/ft sliding. Gas was about 11 -33 units. Gamma markers were correlated throughout the Lodgepole markers against the Pavcilek No. 1. We had problems with our build rates during the curve. We had to lay down 2.3 deg motor, replace with 2.6 degree and it slowed us down considerably in the second half of our curve. Once we reached 11,121' at 89.60 degrees we rotated out another 50 feet of rathole for the casing run. We landed the curve on August 22, 2011 at 9:00 pm MDT.

Lateral Operations 11,161' – 21,151'

After casing was run, drilling resumed at 5:00 am MDT on August 22, 2011. The proposed initial dip for the lateral was set at 90.37 to 90.5 degrees. This dip angle would change a couple of times throughout the course of the lateral ultimately ending up increasing to a 90.7 for the last 4,000' of the well. While drilling ahead within the Three Forks, the gas and oil shows gradually increased with a targeted dip angle of 90.5 degrees produced a TD target TVD of 10,774'. Surveys were taken at 95' intervals to confirm that the bit remained at 90.4 – 90.6 target inclination. Gamma readings remained near the 60 –75 API for most of the remaining well. Background gas after landing in the Three Forks started out at a low of 35 units. This slowly increased while drilling ahead to over 100 units at a measured depth of 11,222' and continued to increase to 200's to 300 units at 18,000' to TD'. Weatherford provided equipment and personnel for MWD and Directional drilling services. The directional drillers and Neset Consulting geologists worked closely together throughout the project to make steering decisions in order to maximize the amount of borehole exposure to the pay zone. Diesel invert drilling fluid was used throughout the lateral with mud weight increasing from 10.2 and 107ppg. A 8.75' bit, 2.0 degree mud motor and mwd tools comprised the first and all subsequent lateral BHA's was run in hole on 4" drill pipe starting at 11,161' MD, after drilling to a depth of 13,231' MD a motor failure was sensed that lead to a new BHA. This BHA will drill to a depth of 15,852' where we have to make another trip at 15,892 due to (MWD) motor failure and the gamma wellbore reading was between 45-65 API showing the lithology was mainly siltstone with traces of limestone and interbedded sandstone sometimes. The siltstone was light to medium gray, gray, tan gray, red, reddish, cream w/ gray striations, scattered dark gray to black being very fine, firm to friable, argillaceous, platy having heavy calcareous cementation with the interbedded sandstone being light tan to tan, cream to light tan cream, translucent, cryptocrystalline, firm to

friable having fair imbedded sandstone grains that was clear to frosty clear having moderately sorted sub angular grains being very fine showing poor to fair intergranular porosity, tight with traces of very light oil staining and dull green yellow fluorescence showing a slow to fast weak to fair cloudy green cut. Gases throughout this section ranged from 123- 350 units of gas and the last BHA was assembled and drilled to a TD of 21,151'' The lateral resulted in a TD of 21,151''MD (10732' TVD) at a final azimuth of 175.23, resulting in a closure vertical section of 10,631.93'.

Conclusion

The precision 426 drilling rig successfully drilled a two section horizontal wellbore within the Three Forks at OXY USA INC Marlene Steffan 1-5-8H-141-97 was drilled methodically using a high level of attention to detail on every aspect of the drilling procedure with a heavy emphasis on safety. A mud program consisting of diesel invert (9.8-10.9ppg) was used to spud to TD to maintain stable hole conditions and permits adequate analysis of gas concentrations. Steering was accomplished by sample evaluation and by following correlative drilling rate and MWD gamma ray marker, making dip estimations based on intersections of these markers with wellbore. Projections of dip were successfully used to maintain the wellbore in the porosity targets, yielding a 100% exposure within Three Forks. Samples from the target consisted of light gray, gray, to gray brown, red, tan, cream, brown Siltstone with interbedded limestone and sandstone sometimes, both intergranular and traces of fracture porosity as well as hydrocarbon shows were seen throughout the lateral.

OXY USA INC Marlene Steffan 1-5-8H-141-97 reached a total measured depth of 21,151'MD on Sept 10, 2011, 48 days after spud date.

*Austin Onipe,
Well Site Geologist*

DAILY LOG OF OPERATIONS

6:00 AM DEPTH

DATE	DEPTH	FOOTAGE	DAY	FORMATION	OPERATIONS
6-Aug-2011	7,106	2200	1	Spearfish	Drill from 7106 to 7415, back ream, 1X, lubricate rig, inspect TDS, deviation survey, accumulation circulation time
7-Aug-2011	7,415	309	2	Opeche salt	Drill from 7937 to 7975, lubricate rig, inspect TDS, clean out and reconnect TD forward line, m drill from 7975 to 8034.
8-Aug-2011	8,034	619	3	Minelussa	Finish surface test MWD/make up bit, breakout, clean and make up filter sub, breakout and layout directional tools, TIH to 2260
9-Aug-2011	8,034	0	4	Minelussa	P/U NMDC tool carrier, MWD tool, orientate motor surface test, make up bit and stab #2 TIH/2260, remove trip nipple and install R/Head TIH/2260-4900, lubricate rig
10-Aug-2011	8,034	0	5	Minelussa	Drill from 8654 to 8758, lubricate rig, inspect TDS, deviation survey, accumulation connection time.
11-Aug-2011	8,557	523	6	Tyler	Drill actual from 9232 to 9327, pump fresh water down to dissolve salts work pipe.
12-Aug-2011	9,327	770	7	Fryburg	Drill from 9327 to 9517, making connection pulled into tight hole @ 9284 bit depth spot 35BBL H2O and freed pipe.
13-Aug-2011	10,098	771	8	Lodgepole	POOH from 10180 to 7055, completed weighting up some OBM to slug the string, POOH from 7055 to 5783, pulled rotating head, install trip nipple, POOH, L7DN vertical BHA, clean rig floor after trip, R7U schlumberger, run platform express(Quad) while logging changed liners to 5.5", checked super choke, repair valves on stand pipe manifold, changed out charging pump.
14-Aug-2011	10,187	0	9	Lodgepole	Attempt to start kick off, some issues with filters on MWD, blew pop off on Pump, attempting to get started with on epump while rebuilding pop off /set pop offs to new liner size, drilling from 10180 to 10187, control drill building departure ramp from vertica; slide drill from 10187 to 10235, some difficulty in departure from vertical taking little extra time to insure clean ramp.
15-Aug-2011	10,235	48	10	Lodgepole	Slide drill from 10187 to 10231, some difficulty in departure from verticle. Weatherfiled mwd failure, pooh to replace tool, hole taking proper fill, no excessive drag, retrieved wear bushing at 2462, laydown 3-675" drill colars continue pooh w/4 hwdp change elevators work bha, pull and check mwd tools at surface, trip in hole to 755, precision drilling had a safety shutdown due to incident on another rig, lighting storm in xtreme close vicinity to rig, secure well and wait for storm to pass, rih to shoe air and test mwd tool, test good will run to 5000 and fill pipe and test tool again.
16-Aug-2011	10,340	105	11	Lodgepole	RIH W?Curve assembly, precautionary circ and wash last stand to bottom, drilling curve sliding from 10276 to 10276, ROP=6.67/hr, oscillating pipe to keep hanging up to minimum, continue oscillating drill string to drill, mixed lubricated bread pill and pump in the hole to help p-rate, drilli curve slide drill string to drill , add graphite to sweep 24PPB as recommned and pump down hole, monitor for change.
17-Aug-2011	10,340	0	12	Lodgepole	Drill from 10340 to 10380, sliding is slow and difficult, mix lubiread and 4PPB graphite sweeps try and aid in slides, start graphite in to system drilling curve sliding from 10380 to 10390 rop at 6ft/hr, problems continue with BHA hanging up and down hole, decision taken to TOOH for tricone insert bit., rig in the hole at minite toreplate thr tricone bit
18-Aug-2011	10,390	50	13	Lodgepole	RIH W/TRICONE BIT FROM 2500 TO 10330 FILL PIPE EVERY 30 STDS, circ and wash , fan bttn and attempt to move any junk to side of hole before drilling, drill curve sliding from 10390 to 10467 to 10475 ROP@7ft/hr, drill curve sliding from 10467 to 10475 rop 5ft/hr, oteco down hole valve on HI PSI mud manifold old leaking , repair same , drill curve sliding from 10475 to 10494 ROP 7/hr. drill curve sliding and rotating from 10494 to 10540 ROP 7ft/hr.
19-Aug-2011	10,494	104	14	Lodgepole	DRILL CURVE SLIDING AND ROTATING FROM 10494 TO 10540, ROP AT 7FT/HR, DRILL CURVE SLIDING RORATING FROM 10540 TO 10642, ROP 8.5FT/HR, DRILL CURVE SLIDING AND ROTATING FROM 10642 TO 10671 ROP 4FT/HR. DRILL CURVE SLIDING/ ROTATE FROM 10671 TO 10705 6FT/HR.

DAILY LOG OF OPERATIONS

6:00 AM DEPTH

DATE	DEPTH	FOOTAGE	DAY	FORMATION	OPERATIONS
20-Aug-2011	10,705	211	15	Lodgepole	DRILL CURVE SLIDE ROTATING FROM 10705 TO 10717 ROP@8FT/HR, CIRCULATE@10717 DIRECTIONAL SURVEY 10654, FLOW CHECK WELL, WELL STATIC, PUMP SLUG AND TRIP OUT OF HOLE BREAK BIT AND LAY DOWN MUD MOTOR, PREP RIG FLOOR FOR GOING IN THE HOLE, P/U NEW MOTOR AND BIT#8, NEW MOTRO AND HANGING UP IN BOP.
21-Aug-2011	10,717	12	16	Lodgepole	RIH W/#6 BHA #7 TO 10717, FILL PIPE, CHECK MWD, BREAK CIRCULATION AND WASH LAST STAND TO BOTTOM, DRILL CURVE SLIDING AND ROTATING FROM 10717 TO 10874, DRILL CURVE SLIDING AND ROTATING FROM 10874 TO 10945#1PUMP DOWN, DRILLING FROM 10945 TO 11005, ROP/10 PER HR
22-Aug-2011	10,945	228	17	Bakken	DRILLING FROM 10945 TO 11005, ROP/10 PER HR, DRILL CURVE DRILLING SLIDING FROM 11005 TO 11171, CIRCULATE 3PPB OVER WEIGHTED SWEEP, OBSERVE SHAKERS, CONDITION FLUID, 15 MINUTE FLOW CHECK, OK, POOH TO RUN 7" CASING HOLE CONDITIONS GOOD TO KOP-CONTINUE POOH, SLM, HOLE CONDITIONS GOOD-LAYING DOWN 5"HWDP AT REPORT TIME
23-Aug-2011	11,717	0	18	Bakken	POOH, SLM, HOLE CONDITIONS GOOD-LAYING DOWN 5" HWDP AT REPORT TIME, COMPLETE LAYING DOWN 5' HWDP AND CHANGE ELEVATOR BACK TO 4', TOOH 4' HWDP STANDING I DERRICK AND LAY DOWN DIRECTIONAL TOOLS, PULLED MWD PROBE, PULL WEAR BUSHING AND CLEAN RIG FLOOR, HELD PRE JOB SAFETY MEETING WITH PRECISION AND ALL THE THIRD PARTY ON RIGGING UP AND RUNNING CASING. RIG UP TO 7" CASING, MAKE UP SHOE JOINT AND TEST SAME, COMPLETE MAKE UP, SHOE TRACK AND FLOAT COLLAR TEST SAME, FLOAT EQUIP, TEST GOOD AND CONTINUE RUNNING CASING INSTALLING CENTRALISER AS PROGRAMMEED, RIG CREW ADJUST TURN BUCKLES ON TOP DRIVE GUIDE RUNNER, CONTINUE RUNNING 7"CASING INSTALLING CENTRALISERS AS PROGRAMMEED CURRNT DEPTH 3367
24-Aug-2011	11,171	0	19	Bakken	RUN 7"CASING TO 7032', RIG UP WYOMING CASING CRT ELEVATOR LINKS, COMPLETE RIG UP WYOMING CASING CRT ELEVATOR LINKS AND 200 TON ELEVATORS, SPOT 130 BBL 10.4PPG LCM PILL 45# PER BBL @11140 AND WAIT FOR HOLE TO HEAL, DRAIN BOP AND LAND 7" CASING, PUMP BOTTOM UP@405AM AND LOADED TOP PLUG, PUMPED 20 BLS FRESH WATER SPACER 20BLS SURFACTANT SPACER, 10BLS FRESH WATER SPACER, FOLLOWED BY 395 SACKS/199 BLS LEAD CEMENT@11.5PPG AND CONTINUE PUMPING 343 SACKS BLS TAIL CEMENT@15.6 PPG AND DISPLACE WITH 414.7 BLS OILBASE MUD.
25-Aug-2011	11,171	0	20	Bakken	SPOT 13BBL 10.4PPG LCM PILL 45# PER BBLW@11140, WAIT ON HOLE TO HEAL, DRAIN BOP AND LAND 7" CASING, HELD 5MIN SAFETY WITHH WY CASING AND LAY DOWN CRT. PUMP BOTTOM PLUG AND LOADED TOP PLUG, PUMPED 20 BLS FRESH WATER SPACER, 20 BLS SURFACTANT SPACER, 10BLS FESH WATER SPACER, FOLLOWED BY 395SACKS/199 BLS TAIL CEMENT@15.6PPG AND DISPLACE WITH 414.7BLS OIL BASE MUD. BUMPED PLUG, WITH 1500 PSI, TEST CASING PUMPED 7BBLs, BACKOUT AND LAY DOWN 7" LANDING JOINT, , TEST STAND PIPE LINES BACK TO MUD PUMPS 250PSI LOW 5MINS/4500PSI AND PERFORM TEST FUNCTION ON ACCUMULATOR, RETRIEVE LAYDOWN TEST PLUG INSTALL WERABUSHING AND ENGAGE 4UPPER LOCK SCREWS, LAYDOWN WEAR BUSHING INSTALLATION TOOL AND 4"TEST JOINT AND CLEAN CLEAR RIG FLOOR, PREPARE HANDLING EQUIPMENT, CHANGE ELEVATOR FROM 5TO 4INCHES AND PREPARE TO PICK UP BHA#8 FOR LATERAL SECTION.

DAILY LOG OF OPERATIONS

6:00 AM DEPTH

DATE	DEPTH	FOOTAGE	DAY	FORMATION	OPERATIONS
26-Aug-2011	11,171	0	21	Middle Bakken	TEST STAND PIPE LINES BACK TO MUD PUMPS 250PSI LOW 5MINS/4500 PSI HIGH 5MINS AND PERFORM FUNCTION TEST ON ACCUMULATOR, RETRIEVE, LAY DOWN TEST PLUG, INSTALL WEARBUSSHING AND ENGAGE 4UPPER LOCK SCREWS, LAYDOWN WEAR BUSHING INSTALLATION TOOL AND 4" TEST JT AND CLEAN CLEAR RIG FLOOR, PREPARE RIG HANDLING AND EQUIPMENT, CHANGE ELEVATORS 5TO4" AND PREPARE TO PICP UP BHA #8 FOR LATERAL DRILLING, TRIP IN THE HOLE TO DRILL LATERAL , CUT AND SLIP DRILLING LINE.
27-Aug-2011	11,171	0	22	Bakken	TRIP IN HOLE, ATTEMPT TO PERFORM CHOKE DRILL, NO CASING PRESSURE OR PUMP STROKES, CHANGE OUT ROTATING HEAD, RETEST ORBIT VALVE AND ROTATING HEAD, COMPLETE CHANGING OUT ROTATING HEAD AND TROUBLE SHOT DRILLING CHOKE AND ORBIT VALVE, PERFORM CHOKE DRILL WITH DRILLER AS PUMP OPERATOR AND TOOL PUSHER, DRILL GOOD FOR 10MINS, DRILL OUT FLOAT COLLAR, CHNAGE SAVER SUB ON TOP DRIVE, DRILL CEMENT AND SHOE AT 11171, DRILL 10' OF NEW HOLE FOM11171 TO 11181, CIRCULATE HOLE FROM 11181 FOR FIT, PERFORM FIT TO EQUIVALENT MUD WEIGHT OF 14.5PPG, APPLIED 2300PSI TO FORMATION DROPPING AND HOLDING@2230PSI WITH TVD@10787=14.5PPG, RIG DOWN AND CHANGE OUT DRILLING CHOKE AND CONTROL PANEL. DRILL AHEAD IN 6" LATERAL SECTION F/11, 181 T/11400
28-Aug-2011	11,171	0	23	Bakken	CHANGE OUT SWACO DRILLING CHOKE, DRILL AHEAD IN 6" LATERAL SECTION FROM 11181 TO 11400, DRILL LATERAL HOLE SLIDING AND ROTATING FROM 11310 TO 11573, DRILL LATERAL HOLE SLIDING AND ROTATING FROM 11573 TO 11965, DRILL LATERAL HOLE SLIDING AND ROTATING FROM 11965 TO 12380, DRILL LATERAL HOLE SLIDING AND ROTATING FROM 12380 TO 12700".
29-Aug-2011	12,700	1529	24	Three Forks	DRILL 6" LATERAL HOLE SLIDING AND ROTATING FROM 12700 TO 13080, DRILL LATERAL HOLE SLIDING AND ROTATING FROM 13080 TO 13231, TROUBLE SHOOT MUD MOTOR, NO DIFFERENTIAL PRESSURE SLIDING OR ROTATING, MIX WEIGHTED SLUG, FLOW CHECK WELL 30MINUTES WELL STATIC, TRIP OUT OF HOLE FOR MUD MOTOR FAILURE, WORK BHA L/D BIT, MOTOR'S DRIVE SHAFT.
30-Aug-2011	13,231	531	25	Three Forks	TOOH FRO MUD MOTOR FAILURE, WORK BHA L/D BIT, MOTOR AND MWD PROBE, NO WEAR TO BIT, THE MUD MOTORS DRIVE SHAFT WAS BROKEN, MADE UP NEW WEATHERFORD MOTOR AND NEW MWD PROBE ASSY RERAN BIT#7 SURFACE TESTED ALL TOOLS, TRIPPED IN HOLE TO 11114 FILLED STRING EVERY 30 STANDS, PULLED TRIP NIPPLE INSTALLED WEATHERFORD ROTATING HEAD, SERVICED RIG, TRIP IN HGOLE FROM 1114 TO 13231, DRILL 6" LATERAL F/13 13231 TO 13612, DRILL FROM 13231 TO 13612, DRILL FROM 13612 TO 13950
31-Aug-2011	13,950	719	26	Three Forks	DRILL LATERAL FROM 13612 TO 13950 , RIG SERVICE, DRILL LATERAL FROM 13950 TO 14948, DRILLFROM LATERAL FROM 14948 TO 15250
1-Sep-2011	15,250	1300	27	Three Forks	DRILL 6" LATERAL F/13,612-T/13,950, RIG SERVICE, DRILL 6" LATERAL F/13,950-T/14,948,DRILL 6" LATERAL F/14,948-T/15,250,CIRC. BOTTOMS UP. BUILD AND PUMP 60 BBLs OF 12.5# PILL,TOOH FOR MUD MTR,TOOH FOR MUD MTR FAILURE
2-Sep-2011	15,852	0	28	Three Forks	TOOH FOR MUD MTR FAILURE. HOLE TOOK PROPER FILL. HAD NO TIGHT SPOTL,/DN DEFECTIVE MUD MOTOR. PULLED MWD PROBE,BIT # 7 HAD ONE BROKEN CUTTER ON THE NOSE,,CLEAN RIG FLOOR AFTER TRIP,M/UP NEW N.O.V. MUD MOTOR. SCRIBE TOOL STRING. PROGRAM AND INSTALL MWD PROBE. TEST TOOLS WITH PUMP. INSTALL BIT # 8. THE AGITATOR AND SHOCK SUB WILL BE INSTALLED THIS TRIP , 3500' BEHIND THE BIT.,TRIP IN HOLE WITH BHA # 11 AND BIT # 8.,TIH W/BHA #11 and Bit #8,Circ. bottoms up at shoe,INSTALL ROT HEAD,TIH W/BHA #11 and Bit #8DRILL 6" HOLE F/15,852-T/15,950,
3-Sep-2011	15,950	48	29	Three Forks	ROTATE AND SLIDE FROM 16664 TO 16736, DRILL FROM 16736 TO 16832, LUBRICATE RIG, DRILL AHEAD FROM 16832 TO 17009

DAILY LOG OF OPERATIONS

6:00 AM DEPTH

DATE	DEPTH	FOOTAGE	DAY	FORMATION	OPERATIONS
4-Sep-2011	17,009	1059	30	Three Forks	DRILL F/16,664'-T/17,042' (378') 58 FPH, 16 WOB, 60 ROT, 217 GPM, 3950 PSI,SLIDE FROM 17,042' TO 17,048'. (20 RIGHT,DRILL FROM 17,048' TO 17,185'.DRILL F/17,337'-T/17,796' (459') 63.31 FPH, 16 WOB, 60 ROT, 65 stks, 218 GPM, 3900, DRILL F/17,849'-T/17,922' (73') 48.66 FPH, 16 WOB, 60 ROT, 65 stks, 218 GPM, 3900,DRILL F/17,922'-T/17,985' (63') 42 FPH, 16 WOB, 60 ROT, 65 stks, 218 GPM, 3900 PSIDRILL F/18,002'-T/18,202' (200') 50 FPH, 16 WOB, 60 ROT, 65 stks, 218 GPM, 3900
5-Sep-2011	18,202	1193	31	Three Forks	DRILL F/17,922'-T/17,985' (63') 42 FPH, 16 WOB, 60 ROT, 65 stks, 218 GPM, 3900 PSI,SLIDE 90 right F/17,985'-T/18,002' (17') 36 FPH, 30 WOB, 62 Stks, 209 GPM, 3500 PSI,DRILL F/18,002'-T/18,466' (464') 56 FPH, 16 WOB, 60 ROT, 65 stks, 218 GPM, 3900,SLIDE FROM 18,466' TO 18,481' (70R).DRILL F/18,481'-T/18,502' (21') 42 FPH, 16 WOB, 60 ROT, 62 stks, 208 GPM, 3907,SLIDE FROM 18,502' TO 18,518'. (90 R),SLIDE 90 right F/18,934'-T/18,952' (18') 18 FPH, 45 WOB, 64 Stks, 215 GPM, 3650 PSI,DRILL F/18,952'-T/18,974' (22') 88 FPH, 16 WOB, 60 ROT, 65 stks, 215 GPM, 3907,SLIDE 90 right F/18,974'-T/18,992' (18') 18 FPH, 25 WOB, 62 Stks, 209 GPM, 3680 PSI,DRILL F/18,992'-T/19,020' (30') 20 FPH, 20 WOB, 60 ROT, 65 stks, 215 GPM, 4000,DRILL F/19,020'-T/19,104' (84') 56 FPH, 20 WOB, 60 ROT, 65 stks, 215 GPM, 4000,SLIDE STRAIGHT UP F/19,104'-T/19,116' (12') 12 FPH, 30 WOB, 62 Stks, 2099,DRILL F/19,116'-T/19,199' (83') 66.4 FPH, 20 WOB, 60 ROT, 65 stks, 215 GPM, 4000,DRILL F/19,199'-T/19,275' (76') 38 FPH, 20 WOB, 60 ROT, 65 stks, 215 GPM, 4000
6-Sep-2011	19,199	997	32	Three Forks	DRILL F/19,020'-T/19,104' (84') 56 FPH, 20 WOB, 60 ROT, 65 stks, 215 GPM, 4000,SLIDE STRAIGHT UP F/19,104'-T/19,116' (12') 12 FPH, 30 WOB, 62 Stks, 209 GPM,DRILL F/19,116'-T/19,199' (83') 66.4 FPH, 20 WOB, 60 ROT, 65 stks, 215 GPM, 4000,DRILL F/19,199'-T/19,438' (239') 41 FPH, 20 WOB, 60 ROT, 65 stks, 215 GPM, 4000,SLIDE FROM 19,438' TO 19,450'. (135R),DRILLED FROM 19,450' TO 19,553,SLIDE FROM 19,553' TO 19,561'. (HIGH SIDE),,DRILLED FROM 19,561' TO 19,579',DRILLED FROM 19,579' TO 19,618',SLIDE FROM 19,618' TO 19,628' 45R,DRILLED FROM 19,628' TO 19,684 DRILL HRZLAT P SLIDE FROM 19,684' TO 19,689' - 5' 60R DRILL HRZLAT P DRILLED FROM 19,689' TO 19,697' DRILL HRZLAT P SLIDE FROM 19,697' TO 19,702'- DRILL HRZLAT P DRILLED FROM 19,702' TO 19,743',DRLG F/19,743' T/19,768' TROUBLE SHOOT MWD TOOL, LOST SIGNAL AFTER PUMPING WEIGHTED SWEEP @ 22:00 HRS 2:00 3:30 1.50 31PRDR TRIP DRILL PT OBSERVE WELL 15 MIN-STATIC-POOH 5 STANDS SRFEQ REPR PT TROUBLE SHOOT MWD CIRC NO GOOD RIGMT REP PT TROUBLE SHOOT TOP DRIVE/ SWAP OUT PROPORTIONAL VALVE -NO GOODPUT OLD ONE BACK IN PRDR TRIP DRILL PT PUMP 60 BBL 12.5# SLUG- FIL TRIP TANKPRDR TRIP DRILL PT POOH FROM 19400'
7-Sep-2011	19,400	201	33	Three Forks	DRLG F/19,743' T/19,768' SRFEQ REPR PT TROUBLE SHOOT MWD TOOL, LOST SIGNAL AFTER PUMPING WEIGHTEDSWEEP @ 22:00 HRS1PRDR TRIP DRILL PT OBSERVE WELL 15 MIN-STATIC-POOH 5 STANDS PRDR SRFEQ REPR PT TROUBLE SHOOT MWD CIRC NO GOOD RIGMT REP PT TROUBLE SHOOT TOP DRIVE/ SWAP OUT PROPORTIONAL VALVE -NO GOODPUTOLD ONE BACK INPRDR TRIP DRILL PT PUMP 60 BBL 12.5# SLUG- FIL TRIP TANKTRIP DRILL PT POOH FROM 19400' TO BIT. THE 4" FLEX WEIGHT ABOVE THE BHA, HAD AFLARED BOX. BIT # 8 WAS 1/8" UNDER GUAGE , AND HAD SEVERAL ROUNDEDAND CHIPPED CUTTERS. NOTE: THE TOP DRIVE IS NOT FUNCTIONINGPROPERLY, PRECISION MECHANICS ON LOCATION, SINCE THIS MORNING,WORKING ON THE ISSUE. WE CAN MAKE UP INTO A CONNECTION, BUT,UNABLE TO BREAK OUT OF THE CONNECTION. TRIP BHA PT TEST THE MWD TOOL, WE PULLED OUT OF THE HOLE,PER WEATHERFORD'SREQUEST. AND CLEAN UP THE RIG FLOOR, AFTER THE TRIP OUT.TRIP BHA PT CHECK MWD TOOL - NO COMMUNICATION - LAY DOWN FIND SEPERATION IN TOOL CAUSING LOSS OF SIGNAL 31PRDR TRIP BHA PT PROGRAM AND PICK UP MWD, TEST BEFORE PICKING UP BIT - TROUBLE SHOOTING SIGNAL FROM MWD TOOL- RIH 1 MORE STAND BELOW SURFACE TO ATTEMPT SIGNAL- NO GOOD LAYING TOOL DOWN TO REBUILD AND TRY AGAINCONTINUE TROUBLE SHOOTING MWD TOOL, SURFACE TEST CHECKED OUT OK TRIP BHA PT MAKE UP BIT #9 BHA #12 AND RIH WITH SAME. DEPTH IS 1805'.

DAILY LOG OF OPERATIONS

6:00 AM DEPTH

DATE	DEPTH	FOOTAGE	DAY	FORMATION	OPERATIONS
8-Sep-2011	19,782	382	34	Three Forks	DRLG F/19,743' T/19,768' SRFEQ REPR PT TROUBLE SHOOT MWD TOOL, LOST SIGNAL AFTER PUMPING WEIGHTED 2:00 3:30 1.50 31PRDR TRIP DRILL PT OBSERVE WELL 15 MIN-STATIC-POOH 5 STANDS PRDR SRFEQ REPR PT TROUBLE SHOOT MWD CIRC NO GOOD RIGMT REP PT TROUBLE SHOOT TOP DRIVE/ SWAP OUT PROPORTIONAL VALVE -NO GOOD OLD ONE BACK IN PRDR TRIP DRILL PT PUMP 60 BBL 12.5# SLUG- FIL TRIP TANK TRIP DRILL PT POOH FROM 19400' TO BIT. THE 4" FLEX WEIGHT ABOVE THE BHA, HAD A FLARED BOX. BIT # 8 WAS 1/8" UNDER GUAGE , AND HAD SEVERAL ROUNDED AND CHIPPED CUTTERS. NOTE: THE TOP DRIVE IS NOT FUNCTIONING PROPERLY, PRECISION MECHANICS ON LOCATION, SINCE THIS MORNING,WORKING ON THE ISSUE. WE CAN MAKE UP INTO A CONNECTION, BUT,UNABLE TO BREAK OUT OF THE CONNECTION. TRIP BHA PT TEST THE MWD TOOL, WE PULLED OUT OF THE HOLE,PER WEATHERFORD'S REQUEST. AND CLEAN UP THE RIG FLOOR, AFTER THE TRIP OUT.TRIP BHA PT CHECK MWD TOOL - NO COMMUNICATION - LAY DOWN FIND SEPERATION IN TOOL CAUSING LOSS OF SIGNAL TRIP BHA PT PROGRAM AND PICK UP MWD, TEST BEFORE PICKING UP BIT - TROUBLE SHOOTING SIGNAL FROM MWD TOOL- RIH 1 MORE STAND BELOW SURFACE TO ATTEMPT SIGNAL- NO GOOD LAYING TOOL DOWN TO REBUILD AND TRY AGAIN CONTINUE TROUBLE SHOOTING MWD TOOL, SURFACE TEST CHECKED OUT OK BHA PT MAKE UP BIT #9 BHA #12 AND RIH WITH SAME. DEPTH IS 1805'
9-Sep-2011	19,782	0	35	Three Forks	DRILLING FROM 20,056' TO 20,436- MAKING SHORT SLIDES, AS NEEDED TOSTAY IN ZONE. SRVRIG PT REPAIR GAS LINE FROM GAS BUSTER TO FLARE. ITWAS DAMAGED, AS A RESULT OF HEAVY FORK-LIFT USE IN DRILL HRZLAT P DRILLED FROM 20,436' TO 20,654'.MADECORRECTION SLIDES AS NEEDED TO STAY IN ZONE..PRDR RIGMT REP PT REPAIR BLEED OFF VALVE ON HIGH PRESSURE MANIFOLD DRILL HRZLAT P DRILLED FROM 20,654' TO 20,798*PRDR RIGMT REP PT WORK ON #1 PUMP AND SROKE COUNTER PRDR DRILL HRZLAT P DRILLING FROM 20,798' TO 211,DRILLING FROM 21100' TO 21151' TD SECTION. CIRC CNDHOL P CIRCULATED 20 BBL,12.5 PPG WEIGHTED SWEEP, PLUS ONE ADDITIONALBOTTOMS-UP. SHAKERS WERE CLEAN, MW IN 10.6 PPG, MW OUT 10.6. BGG =42 PRDR TRIP DRILL P FLOW CHECK WELL, SLUG STRING, AND DROP 1.90" DRIFT.
10-Sep-2011	20,798				TD at 21,151'

BIT RECORD

BIT	BIT	BIT	BIT	SERIAL	JET	DEPTH	HRS		ACC								MUD
<u>NO.</u>	<u>SIZE</u>	<u>MFG</u>	<u>TYPE</u>	<u>NO.</u>	<u>SIZE</u>	<u>OUT</u>	<u>FTGE</u>	<u>RUN</u>	<u>HRS</u>	<u>FT/HR</u>	<u>WOB</u>	<u>RPM</u>	<u>SPM</u>	<u>DEV</u>	<u>PP</u>	<u>WT/VIS</u>	
1	8.34	PDC	XRS	11741353	6x16	2260	2175	12.92	28.85	45	25/30	145/145	60	0	2900	10.3/24	
2	8.34	PDC	XRT	11741352	3x20	5890	3630	54.5	72.75	35	25/30	145/145	60	0-2	3900	10.3/34	
3	8.75	SMITH	FX65D	1163162	6X16	10180	190	16.75	74	45	25/31	175/175	60	2-18	3800	10.2/25	
4	8.75	Security	MSI	11737959	6x16	10390	6109	93.5	110.5	63	25/32	60/60	60	2-18	3700	10.2/66	
5	8.75	Security	FX64D	11737659	6x16	10180	1017	63	9.5	36	25/33	60/61	61	2-19	3800	10.2/67	
6	8.385	Security	FM2465	5008596	4x20	12117	437	13.5	18.75	36	25/34	60/60	62	2-17	2502	10.2/55	
7	8.75	PDC	FX64X	11548800	22X22	17922	1143	26.25	32	38	25/35	50/60	58	2-18	2967	10.2/62	
8	8.75	PDC	FX64X	11548800	22X23	19722	2100	27.22	48	37	22/31	60/62	58	2-18	3909	10.7/63	
9	6	Security	fx64	11562724	6x18	21151	1429	23.22	38	65	25/32	50/60	62	2-17	3990	10.7/56	

MUD RECORD

DATE	DEPTH	WT	VIS	API/HPH T WL	PV	YP	GELS	ES	CHLOM	CAKE	CORR SOLIDS	OWR	CUMM COST
6-Aug-2011	7830	10	72	2	29	12	7*15*8	1,050	12,000	2.00	10.50	81/19	N/A
8-Aug-2011	8097	10	73	2	28	17	9/16/8	1,025	24,000	2.00	11.00	82/18	N/A
9-Aug-2011	8436	10.1	71	2	30	13	8/15/8	975	19,000	2.00	13.00	83/17	N/A
10-Aug-2011	9110	10.3	61	2	25	11	12/15/8	948	18,000	2.00	13.00	83/17	N/A
11-Aug-2011	9620	10.3	29	2	29	23	17/15/17	742	10,000	2.00	13.60	80/20	N/A
12-Aug-2011	10098	10.3	70	2	28	15	13/15/15	776	11,000	2.00	15.00	78/22	N/A
13-Aug-2011	10179	10.3	67	2	28	11	13/15/16	720	14,000	2.00	14.20	79/21	N/A
14-Aug-2011	10179	10.4	97	2	26	12	13/15/17	711	13,000	2.00	14.20	79/21	N/A
15-Aug-2011	10231	10.4	78	2	28	14	12/15/14	690	13,000	2.00	15.00	79/29	N/A
16-Aug-2011	10300	10.4	70	2	28	14	12/15/16	874	13,000	2.00	15.00	79/21	N/A
17-Aug-2011	10390	10.5	79	2	30	14	13/14/16	1,044	13,000	2.00	14.00	79/21	N/A
18-Aug-2011	10467	10.5	61	2	27	13	11/15/18	963	11,000	2.00	17.70	80/20	N/A
19-Aug-2011	10642	10.5	58	2	24	10	16/14/17	657	13,000	2.00	16.20	83/17	N/A
20-Aug-2011	10717	10.6	73	2	26	12	12/15/18	798	13,000	2.00	18.00	83/17	N/A
21-Aug-2011	10874	10.4	53	2	21	11	10/13/11	787	13,000	2.00	17.00	88/12	N/A
22-Aug-2011	11149	10.5	54	2	24	10	10/14/10	828	14,000	2.00	18.00	88/12	N/A
24-Aug-2011	11171	10.4	58	2	24	10	10/14/10	820	14,000	2.00	19.00	88/12	N/A
25-Aug-2011	11171	10.4	85	2	25	13	11,15/18	850	140,000	2.00	16.00	85/15	N/A
26-Aug-2011	11171	10.4	85	2	27	14	10/15/20	850	14,000	2.00	12.00	84/16	N/A
27-Aug-2011	11200	10.5	75	2	30	10	10/15/21	875	12,000	2.00	15.00	84/16	N/A
28-Aug-2011	12061	10.5	53	2	23	14	10/15/18	875	13,000	2.00	14.00	85/15	N/A

MUD RECORD

DATE	DEPTH	WT	VIS	API/HPH T WL	PV	YP	GELS	ES	CHLOM	CAKE	CORR SOLIDS	OWR	CUMM COST
29-Aug-2011	13231	10.5	50	2	26	14	10/14/18	865	12,000	2.00	14.00	84/16	N/A
30-Aug-2011	13231	10.6	63	2	17	8	9/10/19	780	26,000	2.00	13.00	84/16	N/A
31-Aug-2011	14756	10.4	49	2	15	11	7/11/11	660	28,000	2.00	14.00	87/13	N/A
1-Sep-2011	15852	10.5	52	2	15	12	11/10/11	655	24,000	2.00	15.00	87/13	N/A
2-Sep-2011	15852	10.5	65	2	15	11	11/19/11	750	20,000	2.00	15.00	86/14	N/A
3-Sep-2011	16500	10.5	52	2	14	11	10/8/11	750	20,000	2.00	14.00	84/14	N/A
4-Sep-2011	17800	10.4	48	2	16	11	11/10/13	725	20,000	2.00	15.00	88/12	N/A
5-Sep-2011	18857	10.4	55	2	16	17	8/11/7	550	25,000	2.00	15.00	82/18	N/A
6-Sep-2011	19675	10.6	70	2	20	12	13/10/11	550	26,000	2.00	15.00	83/17	N/A
7-Sep-2011	19675	10.4	63	2	21	10	10/14/12	516	38,000	2.00	15.00	85/15	N/A
8-Sep-2011	19675	10.7	64	2	23	10	10/14/13	573	42,000	2.00	15.00	83/17	N/A
9-Sep-2011	20,787	11	59	2	22	10	10/14/14	587	32,000	2.00	15	83/18	N/A

[illegible]

[illegible]

Weatherford®

Report Date: 9/10/2011
 Customer: Oxy
 Job Name: Marlene Steffan
 Well Name: Marlene Steffan

Field: Dunn County
 Rig: Precision 426
 Rig Loc: Dunn County ND

Survey Calculation Method: Minimum Curvature

Magnetic Reference	Target Direction	Total Magnetic Field	Magnetic Dip Angle	Magnetic Declination	Grid Convergence	Total Correction
True North	179.96 deg	56342 nT	72.47 deg	8.27 deg	0.00 deg	8.27 deg
Survey Tie-On	Depth	INC	AZ	TVD	NS	EW
	2215.00 ft	0.53 deg	212.35 deg	2214.87 ft	4.91 ft	-11.83 ft

Depth (ft)	Inc (deg)	Azm (deg)	TVD (ft)	Well Head		VSect (ft)	Dogleg (deg/100ft)
				NS (ft)	EW (ft)		
2356.00	0.62	236.91	2355.86	3.94	-12.82	-3.95	0.18
2451.00	0.61	234.00	2450.86	3.36	-13.66	-3.37	0.03
2546.00	0.69	243.35	2545.85	2.81	-14.58	-2.82	0.14
2641.00	0.63	258.52	2640.85	2.45	-15.60	-2.46	0.19
2736.00	0.58	271.81	2735.84	2.36	-16.59	-2.37	0.16
2830.00	0.44	257.05	2829.84	2.30	-17.42	-2.31	0.20
2925.00	0.45	284.52	2924.83	2.31	-18.14	-2.32	0.22
3020.00	0.43	281.70	3019.83	2.47	-18.85	-2.49	0.03
3115.00	0.35	297.87	3114.83	2.68	-19.45	-2.69	0.14
3209.00	0.36	279.35	3208.83	2.86	-20.00	-2.88	0.12
3304.00	0.43	280.45	3303.82	2.98	-20.64	-2.99	0.07
3397.00	0.35	272.90	3396.82	3.05	-21.27	-3.07	0.10
3491.00	0.22	277.56	3490.82	3.09	-21.74	-3.11	0.14
3586.00	0.16	356.34	3585.82	3.25	-21.93	-3.26	0.26
3680.00	0.07	0.87	3679.82	3.44	-21.93	-3.45	0.10
3775.00	0.25	103.97	3774.82	3.45	-21.73	-3.46	0.29
3870.00	0.36	109.30	3869.82	3.30	-21.25	-3.31	0.12
3965.00	0.49	126.03	3964.82	2.96	-20.64	-2.97	0.19
4060.00	0.35	101.44	4059.81	2.66	-20.03	-2.68	0.24
4155.00	0.43	106.73	4154.81	2.50	-19.40	-2.52	0.09
4250.00	0.36	98.07	4249.81	2.36	-18.76	-2.37	0.10
4344.00	0.49	99.87	4343.81	2.25	-18.07	-2.26	0.14
4439.00	0.43	120.56	4438.80	2.00	-17.37	-2.01	0.18
4534.00	0.44	98.73	4533.80	1.76	-16.70	-1.77	0.17
4629.00	0.56	100.35	4628.80	1.62	-15.88	-1.63	0.13
4723.00	0.58	96.59	4722.79	1.48	-14.96	-1.49	0.05
4818.00	0.49	97.44	4817.79	1.38	-14.08	-1.39	0.10
4912.00	0.56	113.25	4911.78	1.14	-13.26	-1.15	0.17
5007.00	0.56	121.56	5006.78	0.72	-12.43	-0.73	0.09
5101.00	0.41	119.92	5100.78	0.31	-11.75	-0.32	0.16
5195.00	0.38	126.71	5194.77	-0.05	-11.21	0.04	0.06
5290.00	0.22	168.08	5289.77	-0.41	-10.92	0.40	0.27
5383.00	0.22	190.65	5382.77	-0.76	-10.92	0.75	0.09
5478.00	0.72	169.35	5477.77	-1.53	-10.84	1.52	0.55
5572.00	0.99	146.83	5571.76	-2.79	-10.29	2.78	0.45

Depth (ft)	Inc (deg)	Azm (deg)	TVD (ft)	Well Head		VSect (ft)	Dogleg (deg/100ft)
				NS (ft)	EW (ft)		
5667.00	0.75	152.38	5666.75	-4.03	-9.55	4.02	0.27
5761.00	0.75	171.35	5760.74	-5.18	-9.17	5.17	0.26
5855.00	0.95	157.98	5854.73	-6.51	-8.79	6.50	0.30
5950.00	0.97	160.19	5949.71	-8.00	-8.22	7.99	0.04
6044.00	1.07	170.04	6043.70	-9.61	-7.80	9.60	0.21
6139.00	0.99	169.85	6138.68	-11.29	-7.50	11.29	0.08
6234.00	0.88	163.43	6233.67	-12.80	-7.15	12.79	0.16
6328.00	1.13	178.50	6327.66	-14.42	-6.92	14.41	0.38
6423.00	1.05	162.48	6422.64	-16.18	-6.63	16.18	0.33
6518.00	1.05	165.99	6517.62	-17.86	-6.16	17.85	0.07
6612.00	1.25	171.42	6611.61	-19.71	-5.80	19.70	0.24
6707.00	1.04	180.66	6706.59	-21.59	-5.65	21.59	0.29
6800.00	0.98	197.29	6799.57	-23.20	-5.90	23.19	0.32
6895.00	0.85	229.96	6894.56	-24.43	-6.68	24.42	0.56
6990.00	0.84	222.24	6989.55	-25.40	-7.69	25.39	0.12
7084.00	0.62	216.16	7083.54	-26.32	-8.45	26.31	0.25
7179.00	0.79	234.45	7178.54	-27.11	-9.28	27.11	0.29
7274.00	0.78	269.54	7273.53	-27.50	-10.46	27.49	0.50
7369.00	0.53	286.50	7368.52	-27.38	-11.53	27.37	0.33
7463.00	0.84	306.55	7462.51	-26.84	-12.50	26.84	0.41
7558.00	0.84	323.66	7557.50	-25.87	-13.47	25.86	0.26
7653.00	0.56	336.00	7652.50	-24.88	-14.08	24.87	0.33
7748.00	0.45	42.41	7747.49	-24.18	-14.01	24.17	0.59
7842.00	0.51	37.70	7841.49	-23.58	-13.51	23.57	0.08
7937.00	0.49	34.30	7936.49	-22.91	-13.02	22.90	0.04
8032.00	0.56	36.07	8031.48	-22.20	-12.52	22.19	0.08
8126.00	0.36	22.06	8125.48	-21.55	-12.14	21.55	0.24
8221.00	0.38	27.86	8220.48	-21.00	-11.88	20.99	0.04
8315.00	0.29	25.26	8314.48	-20.51	-11.63	20.50	0.10
8409.00	0.35	23.44	8408.47	-20.03	-11.42	20.02	0.06
8504.00	0.22	6.49	8503.47	-19.58	-11.28	19.58	0.16
8599.00	0.16	4.10	8598.47	-19.27	-11.25	19.26	0.06
8693.00	0.07	63.96	8692.47	-19.11	-11.19	19.11	0.15
8788.00	0.14	101.22	8787.47	-19.11	-11.02	19.10	0.10
8883.00	0.14	347.97	8882.47	-19.02	-10.93	19.01	0.25
8978.00	0.45	180.05	8977.47	-19.28	-10.96	19.27	0.62
9073.00	0.62	161.02	9072.47	-20.14	-10.79	20.13	0.26
9167.00	0.43	138.70	9166.46	-20.88	-10.39	20.88	0.29
9262.00	0.25	151.41	9261.46	-21.33	-10.06	21.33	0.20
9357.00	0.44	108.17	9356.46	-21.63	-9.61	21.62	0.33
9452.00	0.41	126.11	9451.46	-21.94	-8.99	21.94	0.14
9547.00	0.25	148.10	9546.46	-22.32	-8.61	22.31	0.21
9642.00	0.35	93.04	9641.45	-22.51	-8.21	22.51	0.31
9736.00	0.35	89.26	9735.45	-22.52	-7.63	22.52	0.02
9831.00	0.35	112.95	9830.45	-22.63	-7.08	22.63	0.15
9926.00	0.14	119.41	9925.45	-22.80	-6.71	22.80	0.22
10021.00	0.22	128.53	10020.45	-22.97	-6.46	22.97	0.09
10116.00	0.30	99.97	10115.45	-23.13	-6.08	23.13	0.16
10145.00	0.07	2.74	10144.45	-23.13	-6.00	23.12	1.09
10204.00	3.26	187.35	10203.42	-24.75	-6.21	24.75	5.64

Depth (ft)	Inc (deg)	Azim (deg)	TVD (ft)	Well Head		VSect (ft)	Dogleg (deg/100ft)
				NS (ft)	EW (ft)		
10236.00	5.75	194.89	10235.32	-27.21	-6.74	27.20	7.98
10267.00	10.23	190.16	10266.01	-31.42	-7.63	31.41	14.59
10299.00	13.71	189.57	10297.31	-37.96	-8.76	37.95	10.88
10338.00	15.03	193.94	10335.09	-47.42	-10.75	47.41	4.38
10370.00	14.43	198.33	10366.04	-55.23	-13.00	55.23	3.96
10401.00	16.47	194.17	10395.92	-63.16	-15.29	63.15	7.48
10433.00	20.08	190.04	10426.30	-72.97	-17.36	72.96	11.98
10465.00	23.27	186.07	10456.03	-84.67	-18.99	84.66	10.97
10496.00	25.51	185.35	10484.26	-97.41	-20.26	97.40	7.29
10528.00	28.85	186.31	10512.73	-111.95	-21.75	111.93	10.53
10559.00	33.85	186.49	10539.19	-127.97	-23.55	127.95	16.13
10591.00	38.31	186.23	10565.05	-146.69	-25.63	146.68	13.95
10622.00	41.02	183.82	10588.91	-166.40	-27.35	166.38	10.05
10654.00	44.00	182.97	10612.50	-187.98	-28.63	187.96	9.48
10686.00	47.58	182.52	10634.81	-210.89	-29.72	210.87	11.23
10717.00	50.65	180.78	10655.10	-234.31	-30.39	234.29	10.77
10748.00	55.26	179.15	10673.77	-259.05	-30.36	259.03	15.45
10780.00	59.83	179.21	10690.94	-286.04	-29.98	286.02	14.28
10811.00	61.53	178.53	10706.12	-313.06	-29.44	313.04	5.81
10843.00	63.65	178.10	10720.85	-341.46	-28.61	341.44	6.73
10875.00	67.39	177.91	10734.10	-370.56	-27.59	370.54	11.70
10906.00	71.67	178.55	10744.94	-399.58	-26.70	399.56	13.94
10938.00	73.65	178.61	10754.48	-430.11	-25.94	430.10	6.19
10969.00	75.45	179.64	10762.74	-459.99	-25.49	459.97	6.63
11001.00	78.40	181.72	10769.98	-491.15	-25.86	491.13	11.18
11033.00	80.59	184.45	10775.81	-522.56	-27.56	522.55	10.83
11064.00	82.15	184.83	10780.46	-553.11	-30.03	553.09	5.18
11096.00	85.32	187.07	10783.96	-584.74	-33.33	584.72	12.11
11110.00	86.71	187.82	10784.93	-598.59	-35.14	598.57	11.28
11214.00	90.14	188.66	10787.79	-701.46	-50.04	701.43	3.40
11246.00	90.21	188.75	10787.69	-733.09	-54.88	733.06	0.36
11341.00	90.63	186.96	10786.99	-827.20	-67.87	827.15	1.94
11435.00	91.19	184.59	10785.50	-920.70	-77.32	920.65	2.59
11530.00	91.12	183.40	10783.58	-1015.45	-83.94	1015.39	1.25
11624.00	90.56	181.82	10782.21	-1109.34	-88.22	1109.28	1.78
11719.00	90.35	181.18	10781.45	-1204.30	-90.71	1204.24	0.71
11814.00	90.14	180.89	10781.05	-1299.28	-92.42	1299.22	0.38
11909.00	90.42	181.67	10780.58	-1394.26	-94.54	1394.19	0.87
12004.00	90.63	181.26	10779.71	-1489.22	-96.97	1489.16	0.48
12099.00	89.93	181.51	10779.25	-1584.19	-99.27	1584.12	0.78
12193.00	89.30	180.87	10779.88	-1678.17	-101.22	1678.10	0.96
12288.00	90.07	180.02	10780.40	-1773.16	-101.96	1773.09	1.21
12383.00	89.30	179.41	10780.92	-1868.16	-101.49	1868.09	1.03
12478.00	91.05	178.45	10780.63	-1963.14	-99.71	1963.07	2.10
12573.00	90.84	178.01	10779.07	-2058.08	-96.78	2058.01	0.51
12668.00	90.49	177.00	10777.96	-2152.98	-92.64	2152.92	1.13
12762.00	89.79	177.24	10777.73	-2246.86	-87.92	2246.80	0.79
12857.00	91.47	177.87	10776.69	-2341.77	-83.87	2341.71	1.89
12952.00	91.12	177.72	10774.54	-2436.67	-80.21	2436.62	0.40
13047.00	91.05	177.46	10772.74	-2531.57	-76.22	2531.52	0.28

Depth (ft)	Inc (deg)	Azm (deg)	TVD (ft)	NS (ft)	EW (ft)	VSect (ft)	Dogleg (deg/100ft)
13142.00	90.70	176.59	10771.29	-2626.43	-71.29	2626.38	0.99
13237.00	90.07	177.79	10770.65	-2721.31	-66.63	2721.27	1.43
13332.00	89.86	177.97	10770.71	-2816.25	-63.12	2816.20	0.29
13427.00	90.00	177.65	10770.83	-2911.18	-59.49	2911.14	0.37
13522.00	89.44	177.89	10771.29	-3006.10	-55.79	3006.06	0.64
13616.00	89.44	177.99	10772.21	-3100.04	-52.41	3100.00	0.11
13711.00	90.14	177.71	10772.56	-3194.97	-48.85	3194.94	0.79
13806.00	90.63	178.50	10771.92	-3289.92	-45.71	3289.88	0.98
13901.00	90.42	178.83	10771.05	-3384.89	-43.50	3384.85	0.41
13996.00	90.21	179.24	10770.53	-3479.87	-41.90	3479.84	0.48
14091.00	90.07	179.17	10770.30	-3574.86	-40.58	3574.83	0.16
14186.00	90.21	180.51	10770.06	-3669.86	-40.31	3669.83	1.42
14280.00	90.91	181.05	10769.15	-3763.84	-41.59	3763.81	0.94
14375.00	90.00	180.93	10768.39	-3858.83	-43.23	3858.79	0.97
14470.00	90.21	180.25	10768.22	-3953.82	-44.21	3953.79	0.75
14564.00	90.42	179.98	10767.70	-4047.82	-44.40	4047.79	0.36
14659.00	89.09	179.33	10768.11	-4142.81	-43.83	4142.78	1.56
14754.00	89.65	179.41	10769.15	-4237.80	-42.78	4237.77	0.60
14849.00	90.77	178.58	10768.80	-4332.78	-41.12	4332.75	1.47
14944.00	90.28	178.66	10767.93	-4427.75	-38.83	4427.72	0.52
15039.00	90.21	178.32	10767.53	-4522.72	-36.33	4522.69	0.37
15134.00	90.63	178.00	10766.83	-4617.67	-33.28	4617.64	0.56
15228.00	90.56	178.32	10765.85	-4711.61	-30.26	4711.59	0.35
15323.00	89.23	177.97	10766.03	-4806.56	-27.18	4806.54	1.45
15417.00	90.91	178.21	10765.91	-4900.50	-24.05	4900.49	1.81
15512.00	90.21	177.89	10764.98	-4995.44	-20.82	4995.43	0.81
15606.00	89.93	177.61	10764.87	-5089.37	-17.13	5089.36	0.42
15701.00	90.21	177.72	10764.75	-5184.29	-13.26	5184.28	0.32
15819.00	90.00	178.04	10764.54	-5302.21	-8.89	5302.20	0.32
15914.00	90.28	177.32	10764.31	-5397.13	-5.05	5397.13	0.81
16009.00	90.84	178.40	10763.38	-5492.06	-1.50	5492.06	1.28
16105.00	91.19	178.15	10761.68	-5588.00	1.39	5588.00	0.45
16200.00	90.98	178.49	10759.88	-5682.94	4.18	5682.94	0.42
16296.00	90.98	179.78	10758.24	-5778.92	5.62	5778.92	1.34
16391.00	91.61	180.97	10756.09	-5873.89	5.00	5873.89	1.42
16486.00	91.05	180.26	10753.88	-5968.86	3.98	5968.86	0.95
16581.00	90.56	179.58	10752.55	-6063.84	4.12	6063.85	0.88
16676.00	90.28	180.25	10751.85	-6158.84	4.26	6158.84	0.76
16772.00	89.93	180.22	10751.68	-6254.84	3.86	6254.84	0.37
16867.00	89.72	179.29	10751.97	-6349.84	4.27	6349.84	1.00
16962.00	89.30	179.26	10752.78	-6444.83	5.47	6444.83	0.44
17057.00	90.00	179.10	10753.36	-6539.81	6.83	6539.82	0.76
17151.00	89.72	179.07	10753.59	-6633.80	8.33	6633.81	0.30
17246.00	90.14	179.52	10753.70	-6728.79	9.50	6728.80	0.65
17341.00	90.49	178.93	10753.18	-6823.78	10.79	6823.79	0.72
17436.00	90.56	178.97	10752.31	-6918.76	12.53	6918.77	0.08
17530.00	90.91	178.81	10751.11	-7012.74	14.35	7012.75	0.41
17625.00	90.84	177.93	10749.66	-7107.69	17.05	7107.70	0.93
17720.00	90.35	177.33	10748.67	-7202.60	20.98	7202.61	0.82
17815.00	90.21	177.65	10748.20	-7297.51	25.14	7297.52	0.37

Depth (ft)	Inc (deg)	Azm (deg)	TVD (ft)	NS (ft)	EW (ft)	VSect (ft)	Dogleg (deg/100ft)
17910.00	90.56	179.13	10747.57	-7392.47	27.81	7392.48	1.60
18005.00	90.07	179.67	10747.04	-7487.46	28.80	7487.48	0.77
18100.00	90.07	179.65	10746.93	-7582.46	29.37	7582.48	0.02
18195.00	90.00	179.81	10746.87	-7677.46	29.81	7677.47	0.18
18290.00	89.93	179.54	10746.93	-7772.45	30.35	7772.47	0.29
18384.00	89.86	178.84	10747.10	-7866.44	31.68	7866.46	0.75
18479.00	90.56	179.93	10746.75	-7961.44	32.70	7961.46	1.36
18573.00	90.56	180.43	10745.83	-8055.43	32.41	8055.45	0.53
18668.00	90.56	180.20	10744.90	-8150.42	31.88	8150.44	0.24
18763.00	90.28	180.37	10744.21	-8245.42	31.41	8245.44	0.34
18857.00	89.86	179.65	10744.09	-8339.42	31.39	8339.44	0.89
18952.00	90.07	180.64	10744.15	-8434.42	31.15	8434.44	1.07
19046.00	89.51	181.50	10744.50	-8528.40	29.40	8528.42	1.09
19140.00	89.79	181.14	10745.07	-8622.37	27.23	8622.39	0.49
19235.00	90.14	180.69	10745.13	-8717.36	25.72	8717.38	0.60
19330.00	90.56	180.14	10744.55	-8812.36	25.03	8812.37	0.73
19425.00	91.82	180.43	10742.57	-8907.33	24.56	8907.35	1.36
19519.00	88.95	180.36	10741.94	-9001.32	23.91	9001.33	3.05
19614.00	89.65	180.38	10743.10	-9096.31	23.29	9096.32	0.74
19709.00	89.51	179.36	10743.80	-9191.30	23.51	9191.32	1.08
19805.00	90.00	179.22	10744.21	-9287.30	24.70	9287.31	0.53
19900.00	89.65	177.96	10744.50	-9382.26	27.04	9382.28	1.38
19996.00	90.28	178.51	10744.56	-9478.22	29.99	9478.24	0.87
20091.00	91.19	178.76	10743.34	-9573.18	32.26	9573.20	0.99
20185.00	91.33	179.21	10741.27	-9667.14	33.92	9667.17	0.50
20281.00	91.19	178.54	10739.16	-9763.10	35.81	9763.12	0.71
20376.00	90.63	177.66	10737.65	-9858.04	38.96	9858.06	1.10
20470.00	90.14	177.46	10737.02	-9951.95	42.96	9951.98	0.56
20565.00	89.86	177.72	10737.02	-10046.86	46.95	10046.89	0.40
20660.00	90.28	177.91	10736.91	-10141.79	50.57	10141.83	0.49
20755.00	90.07	177.34	10736.62	-10236.71	54.51	10236.75	0.64
20850.00	90.28	176.80	10736.33	-10331.59	59.37	10331.63	0.61
20945.00	90.98	176.62	10735.28	-10426.42	64.82	10426.47	0.76
21040.00	91.40	175.97	10733.31	-10521.20	70.96	10521.25	0.81
21091.00	90.84	175.63	10732.31	-10572.06	74.69	10572.11	1.28

Vertical Section is 10632.90 ft along the target direction of 179.96 deg at a measured depth of 21151.97 ft.
Horizontal Displacement is 10633.14 ft along the well bore azimuth of 179.57 deg.
The total correction is 8.27 deg relative to True North.

TVD Gamma Correlations for Marlene Steffan 1-5-8H-141-97

Landing target 10789 TVD

KB Depth:

Pavlicek 33-32H 2625

Marlene Steffan 1-5-8 2650

Marker (** better markers)	MD Marlene	TVD Marlene	Sub-sea Elevations	thickness to next marker	TVD Pavlicek	Sub-sea Elevations	thickness to next marker	Isopach from Pavlicek #1		Isopached Target TVD Landing	Sub-sea Elevations
Mission Canyon	9456	9455	-6805	491	9442	-6817	492	1328		10789	-8139
Lodgepole	9947	9946	-7296	337	9934	-7309	337	836		10782	-8132
LP 1	10285	10283	-7633	171	10271	-7646	171	499		10782	-8132
LP 2	10463	10454	-7804	9	10442	-7817	9	328		10782	-8132
LP 3	10474	10463	-7813	24	10451	-7826	14	319		10782	-8132
LP 4	10490	10478	-7828	38	10465	-7840	39	305		10783	-8133
LP 5	10532	10516	-7866	49	10504	-7879	48	266		10782	-8132
LP 6	10591	10565	-7915	133	10552	-7927	119	218		10783	-8133
False Bakken	10794	10698	-8048	29	10671	-8046	32	99		10797	-8147
Scallion	10858	10727	-8077	11	10703	-8078	11	67		10794	-8144
Upper Bakken	10885	10738	-8088	8	10714	-8089	8	56		10794	-8144
Middle Bakken	10910	10746	-8096	16	10722	-8097	-10722	48		10794	-8144
Three Forks	10969	10762	-8112	-10762		2625	0	10770		21532	-18882

TVD Depth:

Pavlicek 10770 (7' into MB)

Marlene steffan 10789 (7' into MB)

** red when target

Oxy USA, INC
 Marlene Steffan 1-5-8H-141-97
 Section 32 T142N R97W
 DUNN COUNTY, ND
 API# 33-025-01358000

SAMPLE DESCRIPTIONS

Vertical & Horizontal
 7,890' – 21, 151' MD

Began logging at 7,800

7890 – 7920	ANHYDRITE: White, cream, beige, tan, pink-red, opaque to translucent, light gray to gray, waxy, smooth, slightly carbonaceous, trace mica, Shale: gray, red/orange to amber, flakey compaction platy, gritty, light yellow scattered fluorescence, slow pinpoint streaming cloudy cut.		
7920 – 7950	ANHYDRITE: Red to brown, opaque to translucent, white, cream, beige, tan, pink-red, light gray to gray, waxy, smooth, slightly carbonaceous, trace mica, Shale: Dark gray, red/orange to amber, flakey compaction platy, gritty, slight petroliferous odor intense white to light yellow scattered fluorescence, dim pinpoint streaming cloudy cut.		
7950 – 7980	ANHYDRITE: Red to brown, opaque to translucent, white, cream, beige, tan, pink-red, light gray to gray, waxy, smooth, slightly carbonaceous, trace mica, Shale: Dark gray, red/orange to amber, flakey compaction platy, gritty, moderate dolomitic, slight petroliferous odor, dim white to light yellow scattered fluorescence, slow pinpoint streaming cut.		
Tyler	8,280' MD	8,279' TVD	-5,629' SS
7980 – 8010	ANHYDRITE: opaque to translucent, white, cream, beige, tan, pink-red, light gray to gray, waxy, smooth, slightly carbonaceous, trace mica, Shale: Dark gray, red/orange to amber, flakey compaction platy, gritty, slight petroliferous odor intense white to light yellow scattered fluorescence, slow streaming pinpoint cloudy cut.		
8010 – 8040	ANHYDRITE: Red to brown, opaque to translucent, white, cream, beige, tan, pink-red, light gray to gray, waxy, smooth, slightly carbonaceous, trace mica, Shale: Dark gray, red/orange to amber, flakey compaction platy, gritty, slight petroliferous odor intense white to light yellow scattered fluorescence, slow streaming pinpoint cloudy cut.		
8040 – 8070	ANHYDRITE: Red to brown, opaque to translucent, white, cream, beige, tan, pink-red, light gray to gray, waxy, smooth, slightly carbonaceous, trace mica, Shale: Dark gray, red/orange to amber, flakey compaction platy, gritty, moderate dolomitic, fissility, microcrystalline, slight petroliferous odor intense dull white to light yellow scattered fluorescence, slow streaming pinpoint cloudy cut.		
8070 – 8100	ANHYDRITE: Red to brown, opaque to translucent, white, cream, beige, tan, pink-red, light gray to gray, waxy, smooth, slightly carbonaceous, trace mica, Shale: Dark gray, red/orange to amber, flakey compaction platy, gritty, slight petroliferous odor intense white to light yellow scattered fluorescence, slow streaming pinpoint cloudy cut.		

- 8100 – 8130 ANHYDRITE: opaque to translucent, white, cream, beige, tan, pink-red, light gray to gray, waxy, smooth, slightly carbonaceous, trace mica, Shale: Dark gray, red/orange to amber, flakey compaction platy, gritty, slight petroliferous odor intense white to light yellow scattered fluorescence, slow streaming pinpoint cloudy cut.
- 8130 – 8160 ANHYDRITE: Red to brown, opaque to translucent, white, cream, beige, tan, pink-red, light gray to gray, waxy, smooth, slightly carbonaceous, trace mica, Shale: Dark gray, red/orange to amber, flakey compaction platy, gritty, slight petroliferous odor intense white to light yellow scattered fluorescence, slow streaming pinpoint cloudy cut.
- 8160 – 8190 ANHYDRITE: opaque to translucent, white, cream, beige, tan, pink-red, light gray to gray, waxy, smooth, slightly carbonaceous, trace mica, Shale: Dark gray, red/orange to amber, flakey compaction platy, gritty, slight petroliferous odor intense white to light yellow scattered fluorescence, slow streaming pinpoint cloudy cut.
- 8190 – 8220 ANHYDRITE: opaque to translucent, white, cream, beige, tan, pink-red, light gray to gray, waxy, smooth, slightly carbonaceous, trace mica, Shale: Dark gray, red/orange to amber, flakey compaction platy, gritty, slight petroliferous odor intense white to light yellow scattered fluorescence, slow streaming pinpoint cloudy cut.
- 8220 – 8250 ANHYDRITE: Red to brown, opaque to translucent, white, cream, beige, tan, pink-red, light gray to gray, waxy, smooth, slightly carbonaceous, trace mica, Shale: Dark gray, red/orange to amber, flakey compaction platy, gritty, slight petroliferous odor intense white to light yellow scattered fluorescence, slow streaming pinpoint cloudy cut.
- 8250 – 8280 ANHYDRITE: opaque to translucent, white, cream, beige, tan, pink-red, light gray to gray, waxy, smooth, slightly carbonaceous, trace mica, Shale: Dark gray, red/orange to amber, flakey compaction platy, gritty, slight petroliferous odor intense white to light yellow scattered fluorescence, slow streaming pinpoint cloudy cut.
- 8280 – 8310 ANHYDRITE: Red to brown, opaque to translucent, white, cream, beige, tan, pink-red, light gray to gray, waxy, smooth, slightly carbonaceous, trace mica, Shale: Dark gray, red/orange to amber, flakey compaction platy, gritty, slight petroliferous odor intense, light yellow spotted fluorescence, cloudy cut.
- 8310 – 8340 ANHYDRITE: Red to brown, opaque to translucent, white, cream, beige, tan, pink-red, light gray to gray, waxy, smooth, slightly carbonaceous, trace mica, Shale: Dark gray, red/orange to amber, flakey compaction platy, gritty, slight petroliferous odor intense, yellow scattered fluorescence, clear to cloudy cut.
- 8340 – 8370 ANHYDRITE: Red to brown, opaque to translucent, white, cream, beige, tan, pink-red, light gray to gray, waxy, smooth, slightly carbonaceous, trace mica, Shale: Dark gray, red/orange to amber, flakey compaction platy, gritty, slight petroliferous odor intense, light yellow spotted fluorescence, clear yellow cut.
- 8370 – 8400 ANHYDRITE: White, cream, beige, tan, light - dark brown, pink-red, light gray to gray, waxy, smooth, slightly carbonaceous, trace mica, Shale: Dark gray, red/orange to amber, flakey compaction platy, gritty, slight petroliferous odor intense, dim yellow spotted fluorescence, slow yellow streaming pinpoint cut.
- 8400 – 8430 ANHYDRITE: White, cream, beige, tan, light - dark brown, pink-red, light gray to gray, waxy, smooth, slightly carbonaceous, trace mica, Shale: Dark gray, red/orange to amber, flakey compaction platy, gritty, slight petroliferous odor intense, dull yellow scattered fluorescence, yellow streaming pinpoint cut.

- 8430 – 8460 ANHYDRITE: White, cream, beige, tan, light - dark brown, pink-red, light gray to gray, waxy, smooth, slightly carbonaceous, trace mica, Shale: Dark gray, red/orange, flakey compaction platy, gritty, slight petroliferous odor intense, dull yellow scattered fluorescence, slight yellow streaming pinpoint cut.
- 8460 – 8490 DOLOMITE: : Light medium gray to gray, microcrystalline, argillaceous, moderate induration, calcareous, fair amount of sandstone, Anhydrite interbedding, white, light grey, chalky, moderate to poor induration, poor intercrystalline porosity, even spotted fluorescence, dull streaming cut.
- 8490 – 8520 LIMESTONE: Light to medium gray, tan, off white, microcrystalline, argillaceous, moderate induration, highly calcareous, fair amount of sandstone, trace anhydrite, white, light gray, interbedding sandstone, bright mineral fluorescence, cloudy cut.
- 8520 – 8550 ANHYDRITE: Tan to medium gray, white, cream, beige, tan, light gray to gray, waxy, smooth, carbonaceous, trace limestone, Shale: Dark gray, flakey compaction platy, gritty, moderate dolomitic, fissility, slight petroliferous odor, yellow scattered fluorescence, milky cut.
- 8550 – 8580 ANHYDRITE: Light to medium tan, light to dark brown, soft, gummy, minor dolomite, microcrystalline, chalky, trace limestone, slightly argillaceous, moderate induration, poor to no visible porosity, no fluorescence, dim cloudy cut.
- 8580 – 8610 ANHYDRITE: Light to medium tan, light to dark brown, soft, gummy, minor dolomite, microcrystalline, chalky, trace limestone, slightly argillaceous, moderate induration, poor to no visible porosity, no fluorescence, dull cloudy cut.
- 8610 – 8640 ANHYDRITE: Tan to medium gray, white, cream, beige, tan, pink-red, light gray to gray, waxy, smooth, slightly carbonaceous, trace limestone, Shale: Dark gray, red/orange to amber, flakey compaction platy, gritty, moderate dolomitic, fissility, slight petroliferous odor, yellow scattered fluorescence, cloudy cut.
- 8640 – 8670 ANHYDRITE: Tan to medium gray, white, cream, beige, tan, pink-red, moderate Sandstone, light to medium tan, light to medium cream, cream, gray, cream gray, firm, hard, dense, blocky, sub-angular, sub-rounded, microcrystalline, silty, trace shale, carbonaceous, argillaceous, trace anhydrite, moderate induration, spotted green yellow fluorescence, cloudy broad yellow streaming cut.
- 8670 – 8700 ANHYDRITE: Tan to medium gray, white, cream, beige, tan, pink-red, moderate Sandstone, light to medium tan, light to medium cream, cream, gray, cream gray, firm, hard, dense, blocky, sub-angular, sub-rounded, microcrystalline, silty, trace shale, carbonaceous, argillaceous, trace anhydrite, moderate induration, scattered green yellow fluorescence, milky yellow streaming cut.
- 8700 – 8730 ANHYDRITE: Tan to medium gray, white, cream, beige, tan, pink-red, moderate Sandstone, light to medium tan, light to medium cream, cream, gray, cream gray, firm, hard, dense, blocky, sub-angular, sub-rounded, microcrystalline, silty, trace shale, carbonaceous, argillaceous, trace anhydrite, moderate induration, scattered green yellow fluorescence, milky yellow streaming cut.

Kibbey Limestone

8,748' MD

8,747' TVD

-6,097' SS

- 8730 – 8760 DOLOMITE: : Light medium gray to gray, microcrystalline, argillaceous, moderate induration, calcareous, fair amount of sandstone, 20% Anhydrite interbedding, white, light grey, chalky, moderate to poor induration, poor intercrystalline porosity, even spotted fluorescence, dull streaming cut.

- 8760 - 8790 ANHYDRITE: Light to medium tan, light to dark gray, soft, gummy, minor dolomite, microcrystalline, chalky, trace limestone, slightly argillaceous, moderate induration, poor to no visible porosity, no fluorescence, trace cloudy cut.
- 8790 - 8820 ANHYDRITE: Tan to medium gray, white, cream, beige, tan, pink-red, light gray to gray, waxy, smooth, slightly carbonaceous, trace limestone, Shale: Dark gray, red/orange to amber, flakey compaction platy, gritty, moderate dolomitic, fissility, slight petroliferous odor, white yellow scattered fluorescence, cloudy cut.
- 8820 - 8850 ANHYDRITE: Tan to medium gray, white, cream, beige, tan, pink-red, light gray to gray, waxy, smooth, slightly carbonaceous, trace limestone, Shale: Dark gray, red/orange to amber, flakey compaction platy, gritty, moderate dolomitic, fissility, slight petroliferous odor, white yellow scattered fluorescence, cloudy cut.
- 8850 - 8880 LIMESTONE: Medium brown, tan, brown gray, light to medium gray, medium tan, gray, soft to firm, chalky, microcrystalline, moderate induration, poor porosity, calcareous, partly argillaceous, 25% Dolomite, gray creamy gray, light gray, trace amount of anhydrite, creamy off white, fair yellow, scattered fluorescence, cloudy yellow cut.

Charles Salt

8,904' MD

8,903' TVD

-6,253' SS

- 8880 - 8910 DOLOMITE: Light tan brown, tan brown, brown gray, light brown, medium tan, medium gray, soft to firm, chalky, microcrystalline, moderate induration, poor porosity, calcareous, partly argillaceous, 35% limestone, gray creamy gray, light gray, trace abundant anhydrite, creamy off white, fair yellow, trace pinpoint scattered white/orange fluorescence, cloudy yellow cut.
- 8910 - 8940 HALITE: Clear, frosty clear, firm, compacted, scattered siltstone, light orange, rusty orange, chalky, soft, argillaceous, imbedded sand and silt grains, trace anhydrite, slight mineral fluorescence, cloudy yellow green cut.
- 8940 - 8970 HALITE: Clear, frosty clear, firm, compacted, scattered siltstone, light orange, rusty orange, chalky, soft, argillaceous, imbedded sand and silt grains, trace anhydrite, slight mineral fluorescence, cloudy yellow green cut.
- 8970 - 9000 ANHYDRITE: Tan to medium gray, white, cream, beige, tan, pink-red, light gray to gray, waxy, smooth, slightly carbonaceous, trace limestone, Shale: Dark gray, red/orange to amber, flakey compaction platy, gritty, moderate dolomitic, fissility, slight petroliferous odor, white yellow scattered fluorescence, cloudy cut.
- 9000 - 9030 LIMESTONE: Light to medium gray, tan, off white, microcrystalline, argillaceous, moderate induration, highly calcareous, fair amount of sandstone, trace anhydrite, white, light gray, interbedding sandstone, bright mineral fluorescence, cloudy cut.
- 9030 - 9060 LIMESTONE: Medium to dark gray, tan, off white, microcrystalline, argillaceous, moderate induration, highly calcareous, fair amount of sandstone, trace anhydrite, white, light gray, interbedding sandstone, bright spotted fluorescence, cloudy cut.
- 9060 - 9090 LIMESTONE: Medium to dark gray, tan, off white, microcrystalline, argillaceous, moderate induration, highly calcareous, fair amount of sandstone, trace anhydrite, white, light gray, interbedding sandstone, bright scattered fluorescence, bright cloudy cut.

9090 – 9120	LIMESTONE: Medium to dark gray, tan, off white, microcrystalline, argillaceous, moderate induration, highly calcareous, fair amount of sandstone, moderate anhydrite, white, light gray, interbedding sandstone, bright fluorescence, milky cut.		
9120 – 9150	LIMESTONE: Light to medium gray, tan, off white, microcrystalline, argillaceous, moderate induration, highly calcareous, fair amount of sandstone, moderate anhydrite, white, light gray, interbedding sandstone, bright mineral fluorescence, cloudy cut.		
9150 – 9180	LIMESTONE: Light to medium brown, tan, off white, microcrystalline, argillaceous, moderate induration, highly calcareous, fair amount of sandstone, trace anhydrite, white, light gray, interbedding sandstone, bright spotted fluorescence, dull cloudy cut.		
9180 – 9210	ANHYDRITE: White, medium to light gray brown, dark cream, varicolored soft, opaque, argillaceous in part, minor dolomite, very fine grained, slightly argillaceous, sucrosic in part, poor intercrystalline porosity, dull spotty fluorescence, slow streaming milky cut.		
9210 – 9240	SALT: Clear, frosty clear, firm, scattered siltstone, light orange, rusty orange, chalky, soft, argillaceous, imbedded sand and silt grains, trace anhydrite, slight mineral fluorescence, cloudy yellow green cut.		
9240 – 9270	ANHYDRITE: White, medium to light brown, dark cream, cream, varicolored soft, opaque, argillaceous in part, minor dolomite, very fine grained, slightly argillaceous, sucrosic in part, poor intercrystalline porosity, dull spotty fluorescence, slow streaming milky cut.		
Base Last Salt	9,285' MD	9,284' TVD	-6,334' SS
9270 – 9300	ANHYDRITE: White, medium to light gray brown, dark cream, varicolored soft, opaque, argillaceous in part, minor dolomite, very fine grained, slightly argillaceous, sucrosic in part, poor intercrystalline porosity, dull spotty fluorescence, slow streaming milky cut.		
9300 – 9330	ANHYDRITE: White, medium to light brown, dark cream, cream, varicolored soft, opaque, argillaceous in part, minor dolomite, very fine grained, slightly argillaceous, sucrosic in part, poor intercrystalline porosity, dull spotty fluorescence, slow streaming milky cut.		
9330 – 9360	SALT: Clear, frosty clear, firm, scattered siltstone, light orange, rusty orange, chalky, soft, argillaceous, imbedded sand and silt grains, trace anhydrite, slight mineral fluorescence, cloudy yellow green cut.		
9360 – 9390	LIMESTONE: Medium brown, tan, white, brown gray, light to medium gray, medium tan, gray, soft to firm, moderate grainy, chalky, microcrystalline, moderate induration, poor porosity, calcareous, partly argillaceous, Dolomite, gray creamy gray, light gray, trace amount of anhydrite, creamy off white, fair yellow, scattered fluorescence, bright milky green yellow cut.		
9390 – 9420	LIMESTONE: Light medium gray, tan, white, brown gray, light to medium gray, medium tan, gray, soft to firm, moderate grainy, chalky, microcrystalline, moderate induration, poor porosity, calcareous, partly argillaceous, 20% Dolomite, gray creamy gray, light gray, trace amount of anhydrite, creamy off white, fair yellow, scattered fluorescence, milky green yellow cut.		
9420 – 9450	LIMESTONE: Light gray, medium gray, tan, white, brown gray, light to medium gray, medium tan, gray, soft to firm, moderate grainy, chalky, microcrystalline, moderate induration, poor porosity, calcareous, partly argillaceous, Dolomite, gray creamy gray, light gray, spotted fluorescence, bright green yellow cut.		

Mission Canyon:**9,456' MD****9,455' TVD****-6,805' SS**

- 9450 – 9480 Limestone: Light medium gray, tan, white, brown gray, light to medium gray, medium tan, gray, soft to firm, moderate grainy, chalky, microcrystalline, moderate induration, poor porosity, calcareous, partly argillaceous, 20% Dolomite, gray creamy gray, light gray, trace amount of anhydrite, creamy off white, fair yellow, scattered fluorescence, milky green yellow cut.
- 9480 – 9510 Limestone: Light gray, medium gray, tan, white, brown gray, light to medium gray, medium tan, gray, soft to firm, moderate grainy, chalky, microcrystalline, moderate induration, poor porosity, calcareous, partly argillaceous, Dolomite, gray creamy gray, light gray, spotted fluorescence, bright green yellow cut.
- 9510 – 9540 Limestone: Tan, white, brown gray, light to medium gray, medium tan, gray, soft to firm, chalky, microcrystalline, moderate induration, poor porosity, calcareous, partly argillaceous, Dolomite, gray creamy gray, light gray, spotted fluorescence, bright milky green yellow cut.
- 9540 – 9570 Limestone: Gray tan, light to medium gray, cream gray, cream, firm to hard, tight, dense, microcrystalline, fragmental, argillaceous in part, no visible porosity, scattered pale yellow fluorescence, instant cloudy to slow fair streaming cut.
- 9570 – 9600 Limestone: Light tan, light gray tan, cream tan, light cream gray, cream, buff, mottled, blocky, soft to firm, brittle, lightly argillaceous, silty in part, microcrystalline, no visible porosity, scattered dull yellow fluorescence, slow cloudy to fair streaming cut.
- 9600 – 9630 Limestone: Gray tan, medium to dark gray, firm to hard, dense, microcrystalline, fragmental, argillaceous in part, calcareous, no visible porosity, scattered pale yellow fluorescence, slow streaming cut.
- 9630 – 9660 Limestone: Gray tan, medium to dark gray, firm to hard, dense, microcrystalline, fragmental, argillaceous in part, calcareous, no visible porosity, scattered yellow fluorescence, slow fair streaming cut.
- 9660 – 9690 Limestone: Gray tan, medium to dark gray, firm to hard, dense, microcrystalline, fragmental, argillaceous in part, calcareous, no visible porosity, spotted yellow fluorescence, instant cloudy streaming cut.
- 9690 – 9720 Limestone: Gray tan, medium to dark gray, firm to hard, dense, microcrystalline, fragmental, argillaceous in part, calcareous, no visible porosity, spotted dim yellow fluorescence, instant milky slow fair streaming cut.
- 9720 – 9750 Limestone: Light tan, light gray tan, cream tan, light cream gray, cream, buff, mottled, blocky, soft to firm, brittle, lightly argillaceous, silty in part, microcrystalline, no visible porosity, scattered dull yellow fluorescence, slow cloudy to fair streaming cut.
- 9750 – 9780 Limestone: Gray tan, medium to dark gray, firm to hard, dense, microcrystalline, fragmental, argillaceous in part, calcareous, no visible porosity, scattered yellow fluorescence, slow fair streaming cut.
- 9780 – 9810 Limestone: Gray tan, medium to dark gray, firm to hard, dense, microcrystalline, fragmental, argillaceous in part, calcareous, no visible porosity, scattered yellow fluorescence, slow fair streaming cut.

9810 – 9840	LIMESTONE: Light to medium tan, cream tan, light gray tan, buff, cream, blocky, fragmental, firm to hard, microcrystalline, argillaceous, silty in part, no visible porosity, no fluorescence, no cut.
9840 – 9870	LIMESTONE: Light to medium tan, light brown, light to medium gray, tan gray, buff, mostly flaky, soft to firm, brittle, microcrystalline, lightly sucrosic, silty in part, moderately argillaceous, trace pale yellow fluorescence, instant diffuse to faint streaming cut.
9870 – 9900	LIMESTONE: Light to medium tan, light brown, light to medium gray, tan gray, buff, mostly flaky, soft to firm, brittle, microcrystalline, lightly sucrosic, silty in part, moderately argillaceous, trace yellow fluorescence, instant diffuse to faint streaming cut.
9900 – 9930	LIMESTONE: Gray tan, medium to dark gray, firm to hard, dense, microcrystalline, fragmental, argillaceous in part, calcareous, no visible porosity, scattered yellow fluorescence, slow fair streaming cut
Lodgepole	9,947' MD 9,946' TVD -7,296' SS
9930 – 9960	LIMESTONE: Light to medium tan, cream tan, light gray tan, buff, cream, blocky, fragmental, firm to hard, microcrystalline, argillaceous, silty in part, no visible porosity, no fluorescence, no cut.
9960 – 9990	LIMESTONE: Light to medium tan, light brown, light to medium gray, tan gray, buff, mostly flaky, soft to firm, brittle, microcrystalline, lightly sucrosic, silty in part, moderately argillaceous, trace pale yellow fluorescence, instant diffuse to faint streaming cut.
9990 – 10020	LIMESTONE: Dark gray to brown, argillaceous, carbonaceous, mottled, fair indurations, poor to no visible intergranular porosity, bright even yellow fluorescence, bright broad streaming cut
10020 – 10050	LIMESTONE: Light to medium tan, light brown, light to medium gray, tan gray, buff, mostly flaky, soft to firm, brittle, microcrystalline, lightly sucrosic, silty in part, moderately argillaceous, trace yellow fluorescence, instant diffuse to faint streaming cut.
10050 – 10080	LIMESTONE: Gray tan, medium to dark gray, firm to hard, dense, microcrystalline, fragmental, argillaceous in part, calcareous, no visible porosity, scattered yellow fluorescence, slow fair streaming cut.
10080 – 10110	LIMESTONE: Gray tan, dark tan to brown, medium to dark gray, blocky, soft to firm, brittle, lightly argillaceous, silty in part, microcrystalline, no visible porosity, spotted dull yellow fluorescence, milky streaming cut.
10110 – 10140	LIMESTONE: Gray tan, medium to dark gray, dark tan, blocky, soft to firm, brittle, lightly argillaceous, silty in part, microcrystalline, no visible porosity, scattered dim yellow fluorescence, cloudy yellow streaming cut.
10140 – 10170	LIMESTONE: Gray tan, medium to dark gray, brown, blocky, soft to firm, brittle, lightly argillaceous, silty in part, microcrystalline, no visible porosity, scattered dull yellow fluorescence, cloudy streaming cut.
10170 – 10180	LIMESTONE: Gray tan, medium to dark gray, brown, blocky, soft to firm, brittle, moderate shale, red, black, firm, lightly argillaceous, silty in part, microcrystalline, no visible porosity, spotted yellow fluorescence, cloudy streaming cut.

- 10180 – 10190 LIMESTONE: Gray tan, medium to dark gray, brown, blocky, soft to firm, brittle, trace shale, red, black, firm, lightly argillaceous, silty in part, microcrystalline, no visible porosity, scattered dull yellow fluorescence, milky streaming cut.
- 10190 – 10200 LIMESTONE: Gray tan, medium to dark gray, brown, blocky, soft to firm, brittle, trace shale, red, black, firm, lightly argillaceous, silty in part, microcrystalline, no visible porosity, spotted dim yellow fluorescence, cloudy cut.
- 10200 – 10210 LIMESTONE: Gray tan, medium to dark gray, brown, blocky, soft to firm, brittle, trace shale, red, black, firm, lightly argillaceous, silty in part, microcrystalline, no visible porosity, spotted yellow fluorescence, cloudy cut.
- 10210 – 10220 LIMESTONE: Gray tan, medium to dark gray, brown, blocky, soft to firm, brittle, trace shale, red, black, firm, lightly argillaceous, silty in part, microcrystalline, no visible porosity, scattered dull yellow fluorescence, cloudy streaming cut.
- 10220 – 10230 LIMESTONE: Light medium gray, light gray, light cream, gray, gray brown, cream gray, dark gray, trace dark gray laminations, firm, hard, brittle, blocky, sub-rounded, platy, sub-angular, microcrystalline, carbonaceous, argillaceous, interbedded dolomite, calcareous, trace anhydrite, trace calcite, dull yellow fluorescence, slow cloudy streaming green cut.
- 10230 – 10240 LIMESTONE: Gray tan, medium to dark gray, brown, blocky, soft to firm, brittle, trace shale, red, black, firm, lightly argillaceous, silty in part, microcrystalline, no visible porosity, spotted yellow fluorescence, cloudy cut.
- 10240 – 10250 LIMESTONE: Gray tan, medium to dark gray, brown, blocky, soft to firm, brittle, trace shale, red, black, firm, lightly argillaceous, silty in part, microcrystalline, no visible porosity, spotted yellow fluorescence, cloudy cut.
- 10250 – 10260 LIMESTONE: Light cream, cream, light gray, cream gray, gray, gray brown, trace dark gray, firm, hard, brittle, sub-rounded, blocky, sub-angular, platy, microcrystalline, carbonaceous, calcareous, argillaceous, interbedded limestone, trace anhydrite, scattered yellow fluorescence, bright cloudy white streaming cut.
- 10260 – 10270 LIMESTONE: Light cream, cream, light gray, cream gray, gray, gray brown, trace dark gray, firm, hard, brittle, sub-rounded, blocky, sub-angular, platy, microcrystalline, carbonaceous, calcareous, argillaceous, interbedded limestone, trace anhydrite, scattered yellow fluorescence, bright cloudy white streaming cut.
- 10270 – 10280 LIMESTONE: light medium gray, tan, medium to dark gray, brown, blocky, soft to firm, brittle, trace shale, red, black, firm, lightly argillaceous, silty in part, microcrystalline, no visible porosity, scattered dull yellow fluorescence, cloudy streaming cut.
- 10280 – 10290 LIMESTONE: Medium gray, light to dark gray, brown, blocky, soft to firm, brittle, trace shale, red, black, firm, lightly argillaceous, silty in part, microcrystalline, no visible porosity, scattered dull yellow fluorescence, yellow green streaming cut.
- 10290 – 10300 LIMESTONE: Medium gray, light to dark gray, brown, blocky, soft to firm, brittle, trace shale, red, black, firm, lightly argillaceous, silty in part, carbonaceous, microcrystalline, no visible porosity, spotted dim yellow fluorescence, yellowish green streaming cut.
- 10300 – 10310 LIMESTONE: Medium gray, light to dark gray, brown, blocky, soft to firm, brittle, trace shale, red, black, firm, lightly argillaceous, silty in part, microcrystalline, carbonaceous, no visible porosity, scattered dim yellow fluorescence, milky yellow green streaming cut.

- 10310 – 10320 LIMESTONE: Medium gray, light to dark gray, brown, blocky, soft to firm, brittle, trace shale, red, black, firm, lightly argillaceous, silty in part, microcrystalline, carbonaceous, no visible porosity, spotted bright yellow fluorescence, instant cloudy yellow streaming cut.
- 10320 – 10330 LIMESTONE: Medium gray, light to dark gray, brown, blocky, soft to firm, brittle, trace shale, red, black, firm, lightly argillaceous, silty in part, microcrystalline, carbonaceous, no visible porosity, scattered bright yellow fluorescence, instant yellow green streaming cut.
- 10330 – 10340 LIMESTONE: Medium gray, light to dark gray, brown, blocky, soft to firm, brittle, trace shale, red, black, firm, lightly argillaceous, silty in part, microcrystalline, carbonaceous, no visible porosity, bright spotted yellow fluorescence, instant broad streaming cut.
- 10340 – 10350 LIMESTONE: Medium gray, dark gray, brown, blocky, soft to firm, brittle, trace shale, black, firm, lightly argillaceous, silty in part, microcrystalline, carbonaceous, no visible porosity, bright yellow fluorescence, instant bright broad streaming cut.
- 10350 – 10360 LIMESTONE: Light gray, cream, light cream, gray, cream gray, dark gray, trace dark gray laminations, firm, hard, brittle, sub-rounded, blocky, platy, sub-angular, microcrystalline, grainy, carbonaceous, argillaceous, interbedded dolomite; calcareous, trace anhydrite, bright green yellow fluorescence, bright yellow cloudy streaming cut.
- 10360 – 10370 LIMESTONE: Light gray, cream, light cream, gray, cream gray, dark gray, trace dark gray laminations, firm, hard, brittle, sub-rounded, blocky, platy, sub-angular, microcrystalline, grainy, carbonaceous, argillaceous, interbedded dolomite; calcareous, trace anhydrite, bright green yellow fluorescence, bright yellow cloudy streaming cut.
- 10370 – 10380 LIMESTONE: Light cream, cream, light gray, cream gray, gray, gray brown, trace dark gray, firm, hard, brittle, sub-rounded, blocky, sub-angular, platy, microcrystalline, carbonaceous, calcareous, argillaceous, interbedded limestone, trace anhydrite, scattered yellow fluorescence, bright cloudy white streaming cut.
- 10380 – 10390 LIMESTONE: Light cream, cream, light gray, cream gray, gray, gray brown, trace dark gray, firm, hard, brittle, sub-rounded, blocky, sub-angular, platy, microcrystalline, carbonaceous, calcareous, argillaceous, interbedded limestone, trace anhydrite, spotted yellow fluorescence, bright white milky streaming cut.
- 10390 – 10400 LIMESTONE: Light gray, cream, light cream, gray, cream gray, dark gray, trace dark gray laminations, firm, hard, brittle, sub-rounded, blocky, platy, sub-angular, microcrystalline, grainy, carbonaceous, argillaceous, interbedded dolomite; calcareous, trace anhydrite, bright green yellow fluorescence, bright yellow cloudy streaming cut.
- 10400 – 10410 LIMESTONE: Light gray, cream, light cream, gray, cream gray, dark gray, trace dark gray laminations, firm, hard, brittle, sub-rounded, blocky, platy, sub-angular, microcrystalline, grainy, carbonaceous, argillaceous, interbedded dolomite; calcareous, trace anhydrite, bright green yellow fluorescence, bright yellow cloudy streaming cut.
- 10410 – 10420 LIMESTONE: Light gray, cream, light cream, gray, cream gray, dark gray, trace dark gray laminations, firm, hard, brittle, sub-rounded, blocky, platy, sub-angular, microcrystalline, grainy, carbonaceous, argillaceous, interbedded dolomite; calcareous, trace anhydrite, bright green yellow fluorescence, bright yellow cloudy streaming cut.

- 10420 – 10450 LIMESTONE: Light brown, tan, dark tan, cream, cream tan, dark gray, firm, brittle, sub-rounded, blocky, sub-angular, grainy, carbonaceous, slightly argillaceous, poor intergranular porosity, bright green yellow fluorescence, bright yellow milky cut.
- 10450 – 10480 LIMESTONE: Dark tan, cream, cream tan, dark gray, brown, dark brown, light brown, tan, firm, brittle, sub-rounded, blocky, sub-angular, grainy, carbonaceous, argillaceous, poor intergranular porosity, bright green yellow fluorescence, bright yellow cloudy streaming cut.
- 10480 – 10510 LIMESTONE: Dark gray, brown, dark brown, light brown, tan, dark tan, firm, brittle, sub-rounded, blocky, sub-angular, grainy, carbonaceous, argillaceous, poor intergranular porosity, bright green yellow fluorescence, instant bright yellow cloudy streaming cut.
- 10510 – 10540 LIMESTONE: Light gray, cream, light cream, gray, cream gray, dark gray, trace dark gray laminations, firm, hard, brittle, sub-rounded, blocky, platy, sub-angular, microcrystalline, grainy, carbonaceous, argillaceous, interbedded dolomite; calcareous, trace anhydrite, even dull yellow fluorescence, dull yellow milky cut.
- 10540 – 10570 LIMESTONE: Light gray, cream, light cream, gray, cream gray, dark gray, trace dark gray laminations, firm, hard, brittle, sub-rounded, blocky, platy, sub-angular, microcrystalline, grainy, carbonaceous, argillaceous, interbedded dolomite; calcareous, trace anhydrite, even dull yellow fluorescence, weak milky cut.
- 10570 – 10600 LIMESTONE: Light gray, cream, light cream, gray, cream gray, dark gray, trace dark gray laminations, firm, hard, brittle, sub-rounded, blocky, platy, sub-angular, microcrystalline, grainy, carbonaceous, argillaceous, interbedded dolomite; calcareous, trace anhydrite, even dull yellow fluorescence, dull instant streaming cut.
- 10600 – 10630 LIMESTONE: Light cream, gray, cream gray, dark gray, light gray, cream, trace dark gray laminations, firm, hard, brittle, sub-rounded, blocky, sub-angular, microcrystalline, grainy, carbonaceous, argillaceous, calcareous, even dull green yellow fluorescence, bright yellow cloudy cut.
- 10630 – 10660 LIMESTONE: Cream gray, dark gray, light gray, cream, light cream, gray, trace dark gray laminations, firm, hard, brittle, sub-rounded, blocky, sub-angular, microcrystalline, grainy, carbonaceous, argillaceous, calcareous, even dull yellow fluorescence, instant bright green yellow cut.
- 10660 – 10690 LIMESTONE: Cream gray, dark gray, light gray, cream, light cream, gray, trace dark gray laminations, firm, hard, brittle, sub-rounded, blocky, sub-angular, microcrystalline, grainy, carbonaceous, argillaceous, calcareous, even dull yellow fluorescence, instant bright green yellow cut.
- 10690 – 10720 LIMESTONE: Light gray, cream, light cream, gray, cream gray, dark gray, trace dark gray laminations, firm, hard, brittle, sub-rounded, blocky, platy, sub-angular, microcrystalline, grainy, carbonaceous, argillaceous, interbedded dolomite; calcareous, trace anhydrite, even dim yellow fluorescence, slow broad streaming cut.
- 10720 – 10750 LIMESTONE: Red, tan to brown, white, gray, cream gray, dark gray, trace dark gray laminations, firm, hard, brittle, sub-rounded, blocky, platy, sub-angular, microcrystalline, grainy, carbonaceous, argillaceous, interbedded dolomite; calcareous, trace anhydrite, trace shale, black, even yellow fluorescence, weak streaming cut.

- 10750 – 10780 LIMESTONE: Gray, light medium gray, tan to brown, white, gray, cream gray, dark gray, trace dark gray laminations, firm, hard, brittle, sub-rounded, blocky, platy, sub-angular, microcrystalline, grainy, carbonaceous, argillaceous, calcareous, trace anhydrite, scattered dull fluorescence, weak slow streaming cut.
- 10780 – 10810 LIMESTONE: Light gray, cream, light cream, gray, cream gray, dark gray, trace dark gray laminations, firm, hard, brittle, sub-rounded, blocky, platy, sub-angular, microcrystalline, grainy, carbonaceous, argillaceous, interbedded dolomite; calcareous, trace anhydrite, even dim yellow fluorescence, slow broad streaming cut.
- 10810 – 10840 LIMESTONE: Dark gray, brown, dark brown, light brown, tan, dark tan, firm, brittle, sub-rounded, blocky, sub-angular, grainy, carbonaceous, argillaceous, poor intergranular porosity, even dim yellow fluorescence, instant bright yellow cloudy cut.
- 10840 – 10870 LIMESTONE: Dark brown, light brown, tan, dark tan, dark gray, brown, firm, brittle, sub-rounded, blocky, sub-angular, grainy, carbonaceous, argillaceous, poor intergranular porosity, even dim yellow fluorescence, instant bright yellow cloudy streaming cut.
- 10870 – 10900 SHALE: Black, dark gray, brown, dark brown, light brown, tan, dark tan, blocky, carbonaceous, earthy, firm, hard, brittle, sub rounded, platy, sub angular, abundant limestone, even dim yellow fluorescence, instant bright yellow milky streaming cut.
- 10900 – 10930 LIMESTONE: Light gray, cream, light cream, gray, cream gray, dark gray, black, trace dark gray laminations, firm, hard, brittle, sub-rounded, blocky, platy, sub-angular, microcrystalline, grainy, carbonaceous, argillaceous, calcareous, moderate shale, even dim yellow fluorescence, instant bright yellow streaming cut.
- 10930 – 10960 LIMESTONE: Light cream, gray, cream gray, dark gray, light gray, cream, black trace dark gray laminations, firm, hard, brittle, sub-rounded, blocky, platy, sub-angular, microcrystalline, grainy, carbonaceous, argillaceous, calcareous, trace shale, even dim yellow fluorescence, instant yellow streaming cut.

Three Forks

10,969' MD

10,762' TVD,

-8,112' SS

- 10960 – 10990 SILTSTONE: Red, tan to brown, white, gray, trace dark gray laminations, firm, hard, brittle, sub-rounded, blocky, platy, sub-angular, microcrystalline, grainy, carbonaceous, argillaceous, interbedded dolomite; calcareous, trace anhydrite, trace shale, black, green trace salt, clear, scattered yellow fluorescence, slow pin point streaming cut.
- 10990 – 11020 SILTSTONE: Red, tan to brown, white, gray, trace dark gray laminations, firm, hard, brittle, sub-rounded, blocky, platy, sub-angular, microcrystalline, grainy, carbonaceous, argillaceous, interbedded dolomite; calcareous, trace anhydrite, trace shale, black, green trace salt, clear, spotted yellow fluorescence, bright instant streaming cut.
- 11020 – 11050 SILTSTONE Gray, light gray, white, gray, trace dark gray laminations, firm, hard, brittle, sub-rounded, blocky, platy, sub-angular, microcrystalline, grainy, carbonaceous, argillaceous, calcareous, trace anhydrite, black, green trace salt, clear, spotted yellow fluorescence, green yellow cut.
- 11050 – 11080 SILTSTONE: Light gray, medium gray, tan to brown, white, gray, trace dark gray laminations, firm, hard, brittle, sub-rounded, blocky, platy, sub-angular, microcrystalline, grainy, carbonaceous, argillaceous, interbedded dolomite; calcareous, trace anhydrite, black, green trace salt, clear, spotted yellow fluorescence, bright instant streaming cut.

- 11080 – 11110 SILTSTONE: Tan to brown, white, gray, light gray, medium gray, trace dark gray laminations, firm, hard, brittle, sub-rounded, blocky, platy, sub-angular, microcrystalline, grainy, carbonaceous, argillaceous, even dull yellow fluorescence, instant bright yellow streaming cut.
- 11110 – 11140 SILTSTONE: Gray, light gray, medium gray, tan to brown, white, trace dark gray laminations, firm, hard, brittle, sub-rounded, blocky, platy, sub-angular, microcrystalline, grainy, carbonaceous, argillaceous, even dull yellow fluorescence, slow yellow streaming cut.
- 11140 – 11170 SILTSTONE: Medium gray, tan to brown, white, gray, light gray, trace dark gray laminations, firm, hard, brittle, sub-rounded, blocky, platy, sub-angular, microcrystalline, grainy, carbonaceous, argillaceous, even yellow fluorescence, bright yellow streaming cut.
- 11170 – 11200 SILTSTONE: Light to medium gray, gray, light to medium tan, tan, light to medium brown, very fine to fine, hard, argillaceous, platy, limestone cementation, trace limestone, light to medium tan, cream to cream tan, cryptocrystalline, firm to hard, brittle, slightly dolomitic, moderately sorted, subangular to subrounded, even yellow fluorescence, milky yellow pinpoint streaming cut.
- 11200 – 11230 SILTSTONE: Light gray, medium gray, gray, tan to medium tan, brown, very fine to fine, hard, argillaceous, platy, limestone cementation, trace limestone, light to medium tan, cream to cream tan, cryptocrystalline, firm to hard, brittle, slightly dolomitic, moderately sorted, subangular to subrounded, even yellow fluorescence, milky yellow green milky cut.
- 11230 – 11260 SILTSTONE: Light to medium gray, gray, light to medium tan, tan, light to medium brown, very fine to fine, hard, argillaceous, platy, limestone cementation, trace limestone, light to medium tan, cream to cream tan, cryptocrystalline, firm to hard, brittle, slightly dolomitic, moderately sorted, subangular to subrounded, even yellow fluorescence, milky yellow pinpoint streaming cut.
- 11260 – 11290 SILTSTONE: Medium gray, tan to brown, white, gray, light gray, trace dark gray laminations, firm, hard, brittle, sub-rounded, blocky, platy, sub-angular, microcrystalline, grainy, carbonaceous, argillaceous, even yellow fluorescence, bright yellow streaming cut.
- 11290 – 11320 SILTSTONE: Light to medium gray, gray, light to medium tan, tan, light to medium brown, very fine to fine, hard, argillaceous, plate, trace pyrite, slightly dolomitic, moderately sorted, subangular to subrounded, spotted yellow fluorescence, slow pinpoint streaming cut.
- 11320 – 11350 SILTSTONE: Light to medium gray, tan, light medium tan, tan, light to medium brown, very fine to fine, hard, argillaceous, platy, pyrite, slightly dolomitic, moderately sorted, subangular to subrounded, even yellow fluorescence, milky yellow pinpoint streaming cut.
- 11350 – 11380 SILTSTONE: Medium gray, light to medium gray, light to medium tan, cream, very fine, hard, argillaceous, platy, trace limestone, light to medium gray, blocky, firm to hard, brittle, slightly dolomitic, moderately sorted, subangular to subrounded, spotted dull yellow green fluorescence, instant yellow milky cut.

- 11380 – 11410 SILTSTONE: Light gray, medium gray, light tan to medium tan, brown, very fine, hard, argillaceous, platy, trace limestone, light to medium gray, blocky, firm to hard, brittle, slightly dolomitic, moderately sorted, subangular to subrounded, spotted dull yellow green fluorescence, instant yellow milky cut.
- 11410 – 11440 SILTSTONE: Medium gray, tan to medium brown, light medium tan, cream, very fine, hard, argillaceous, platy, slightly dolomitic, moderately sorted, subangular to subrounded, spotted dull yellow green fluorescence, instant yellow milky cut.
- 11440 – 11470 SILTSTONE: Gray brown, grey clear, argillaceous, limey, trace pyrite, interbedded with limestone, light to medium gray, microcrystalline, mudstone to wackstones, bright yellow green fluorescence, green yellow milky cut.
- 11470 – 11500 SILTSTONE: Light to medium gray, light to medium tan, cream, very fine, hard, argillaceous, platy, trace limestone, light to medium gray, blocky, firm to hard, brittle, slightly dolomitic, moderately sorted, even yellow green fluorescence, green yellow milky cut.
- 11500 – 11530 SILTSTONE: Gray brown, grey clear, argillaceous, limey, trace pyrite, interbedded with limestone, light to medium gray, microcrystalline, mudstone to wackstones, bright yellow green fluorescence, green yellow milky cut.
- 11530 – 11560 SILTSTONE: Gray, medium gray, tan, grey clear, argillaceous, limey, trace pyrite, interbedded with limestone, light to medium gray, microcrystalline, mudstone to wackstones, bright yellow green fluorescence, yellow green slow cut.
- 11560 – 11590 SILTSTONE: Medium gray, light medium gray, argillaceous, limey, trace pyrite, interbedded with limestone, light to medium gray, microcrystalline, mudstone to wackstones, bright yellow green fluorescence, green yellow milky cut.
- 11590 – 11620 SILTSTONE: Gray brown, grey clear, argillaceous, limey, trace pyrite, interbedded with limestone, light to medium gray, microcrystalline, mudstone to wackstones, bright yellow green fluorescence, green yellow milky cut.
- 11620 – 11650 SILTSTONE: Light tan, medium gray, cream, argillaceous, limey, trace pyrite, interbedded with limestone, light to medium gray, microcrystalline, mudstone to wackstones, even yellow green fluorescence, yellow instant milky cut.
- 11650 – 11680 SILTSTONE: Gray brown, grey clear, argillaceous, limey, trace pyrite, interbedded with limestone, light to medium gray, microcrystalline, mudstone to wackstones, bright yellow green fluorescence, green yellow milky cut.
- 11680 – 11710 SILTSTONE: Medium gray, light medium gray, argillaceous, limey, trace pyrite, interbedded with limestone, light to medium gray, microcrystalline, mudstone to wackstones, bright yellow green fluorescence, green yellow milky cut.
- 11710 – 11740 SILTSTONE: Medium gray, light medium gray, argillaceous, limey, trace pyrite, interbedded with limestone, light to medium gray, microcrystalline, mudstone to wackstones, bright yellow green fluorescence, green yellow milky cut.
- 11740 – 11770 SILTSTONE: Dark gray, gray, light gray, argillaceous, very fine to fine grained, argillaceous, carbonaceous, subrounded, interbedded limestone, light to medium gray, microcrystalline, mudstone to wackstone, moderate induration, even yellow fluorescence, instant bright blue milky streaming cut.

- 11770 – 11800 SILTSTONE: Dark gray, gray, light gray, very fine to fine grained, argillaceous, carbonaceous, subrounded, interbedded limestone, medium gray, microcrystalline, mudstone to wackestone , moderate induration, even yellow fluorescence, bright blue milky streaming cut.
- 11800 – 11830 SILTSTONE: Gray, light gray, dark gray, fine to medium grained, argillaceous, carbonaceous, interbedded limestone, light gray, microcrystalline, mudstone to wackestone , moderate induration, even yellow fluorescence, instant bright blue milky cut.
- 11830 – 11860 SILTSTONE: Gray, light gray, dark gray, fine to medium grained, argillaceous, carbonaceous, subrounded, interbedded limestone, medium gray, microcrystalline, mudstone to wackestone , moderate induration, even yellow fluorescence, instant bright blue milky streaming cut.
- 11860 – 11890 SILTSTONE: Light gray, dark gray, gray, fine to medium grained, argillaceous, carbonaceous, subrounded, interbedded limestone, medium gray, microcrystalline, mudstone to wackestone , poor to moderate induration, even bright yellow fluorescence, bright blue milky cut.
- 11890 – 11920 SILTSTONE: Light gray, dark gray, gray, fine to medium grained, argillaceous, carbonaceous, subrounded, interbedded limestone, medium gray, microcrystalline, mudstone to wackestone , poor to moderate induration, even bright yellow fluorescence, instant bright blue milky cut.
- 11920 – 11950 SILTSTONE: Dark gray, gray, light gray, fine to medium grained, argillaceous, carbonaceous, subrounded, interbedded limestone, medium gray, microcrystalline, wackestone , poor to moderate induration, even bright yellow fluorescence, instant bright blue milky cut.
- 11950 – 11980 SILTSTONE: Light gray, dark gray, gray, fine to medium grained, argillaceous, carbonaceous, subrounded, interbedded limestone, medium gray, microcrystalline, mudstone to wackestone , poor to moderate induration, even bright yellow fluorescence, instant bright blue milky cut.
- 11980 – 12010 SILTSTONE: Light gray, dark gray, gray, fine to medium grained, argillaceous, carbonaceous, subrounded, interbedded limestone, medium gray, microcrystalline, mudstone to wackestone , poor to moderate induration, even bright yellow fluorescence, instant bright blue milky cut.
- 12010 – 12040 SILTSTONE: Dark gray, gray, light gray, fine to medium grained, argillaceous, carbonaceous, subrounded, interbedded limestone, medium gray, microcrystalline, mudstone to wackestone , poor to moderate induration, even bright yellow fluorescence, instant bright blue milky cut.
- 12040 – 12070 SILTSTONE: Gray, dark gray, light gray, fine grained, argillaceous, carbonaceous, subrounded, interbedded limestone, light gray, microcrystalline, mudstone to wackestone, poor to moderate induration, even yellow fluorescence, instant bright blue milky streaming cut.
- 12070 – 12100 SILTSTONE: Dark gray, gray, light gray, very fine to medium grained, argillaceous, carbonaceous, subrounded, interbedded limestone, medium gray, microcrystalline, mudstone to wackestone , poor to moderate induration, even yellow fluorescence, bright blue milky cut.

- 12100 – 12130 SILTSTONE: Light gray, dark gray, gray, very fine to medium grained, argillaceous, carbonaceous, subrounded, interbedded limestone, medium gray, microcrystalline, wackestone, poor to moderate induration, even bright yellow fluorescence, instant bright blue milky streaming cut.
- 12130 – 12160 SILTSTONE: Gray, dark gray, light gray, very fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright yellow fluorescence, instant bright blue cloudy cut.
- 12160 – 12190 SILTSTONE: Light gray, dark gray, gray, very fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright yellow fluorescence, bright blue cloudy streaming cut.
- 12190 – 12220 SILTSTONE: Dark gray, gray, light gray, very fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright yellow green fluorescence, bright blue cloudy streaming cut.
- 12220 – 12250 SILTSTONE: Light gray, dark gray, gray, very fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright yellow fluorescence, bright blue milky broad streaming cut.
- 12250 – 12280 SILTSTONE: Dark gray, gray, light gray, very fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright yellow green fluorescence, instant bright blue milky broad streaming cut.
- 12280 – 12310 SILTSTONE: Light gray, dark gray, gray, very fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright yellow fluorescence, bright blue cloudy streaming cut.
- 12310 – 12340 SILTSTONE: Light gray, dark gray, gray, very fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even yellow fluorescence, bright blue milky cut.
- 12340 – 12370 SILTSTONE: Dark gray, gray, light gray, very fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright yellow fluorescence, instant bright blue milky streaming cut.
- 12370 – 12400 SILTSTONE: Gray, dark gray, light gray, very fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright yellow fluorescence, instant bright blue cloudy broad streaming cut.
- 12400 – 12430 SILTSTONE: Dark gray, light gray, gray, very fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright yellow fluorescence, instant bright blue cloudy streaming cut.
- 12430 – 12460 SILTSTONE: Gray, light gray, dark gray, fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even yellow fluorescence, instant bright blue milky cut.
- 12460 – 12490 SILTSTONE: Dark gray, gray, light gray, very fine to medium grained, argillaceous, carbonaceous, subrounded, interbedded limestone, medium gray, microcrystalline, mudstone to wackestone, poor to moderate induration, even yellow fluorescence, instant bright blue milky streaming cut.

- 12490 – 12520 SILTSTONE: Light gray, medium gray, light gray, very fine to medium grained, argillaceous, carbonaceous, subrounded, interbedded limestone, medium gray, microcrystalline, mudstone to wackestone , poor to moderate induration, dull even yellow fluorescence, green yellow streaming cut.
- 12520 – 12550 SILTSTONE: Medium gray, light gray, tan to cream, brown, very fine to medium grained, argillaceous, carbonaceous, subrounded, interbedded limestone, medium gray, microcrystalline, mudstone to wackestone , poor to moderate induration, even yellow fluorescence, instant green milky streaming cut.
- 12550 – 12580 SILTSTONE: Gray, dark gray, light gray, very fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright yellow fluorescence, instant bright blue cloudy broad streaming cut.
- 12580 – 12610 SILTSTONE: Light gray, medium gray, light gray, very fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright yellow fluorescence, instant bright blue cloudy broad streaming cut.
- 12610 – 12640 SILTSTONE: Light gray, dark gray, gray, very fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright yellow fluorescence, bright blue cloudy streaming cut.
- 12640 – 12670 SILTSTONE: Light gray, medium gray, gray, very fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright yellow fluorescence, faint blue cloudy streaming cut.
- 12670 – 12700 SILTSTONE: Light medium gray, dark gray, gray, very fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright yellow fluorescence, bright blue cloudy streaming cut.
- 12700 – 12730 SILTSTONE: Light medium gray, tan , cream gray, gray, very fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright yellow fluorescence, yellow green cut.
- 12730 – 12760 SILTSTONE: Light gray, medium gray, light gray, very fine to medium grained, argillaceous, carbonaceous, subrounded, interbedded limestone, medium gray, microcrystalline, mudstone to wackestone , poor to moderate induration, dull even yellow fluorescence, green yellow streaming cut.
- 12760 – 12790 SILTSTONE: Medium gray, light gray, tan to cream, brown, very fine to medium grained, argillaceous, carbonaceous, subrounded, interbedded limestone, medium gray, microcrystalline, mudstone to wackestone , poor to moderate induration, even yellow fluorescence, instant green milky streaming cut.
- 12790 – 12820 SILTSTONE: Gray, dark gray, light gray, very fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright yellow fluorescence, instant bright blue cloudy broad streaming cut.
- 12820 – 12850 SILTSTONE: Light gray, medium gray, light gray, very fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright yellow fluorescence, instant bright blue cloudy broad streaming cut.
- 12850 – 12880 SILTSTONE: Light gray, dark gray, gray, very fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright yellow fluorescence, bright blue cloudy streaming cut.

- 12880 – 12910 SILTSTONE: Light medium gray, dark gray, gray, very fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright yellow fluorescence, bright blue cloudy streaming cut.
- 12910 – 12940 SILTSTONE: Light medium gray, tan , cream gray, gray, very fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright yellow fluorescence, yellow green cut.
- 12940 – 12970 SILTSTONE: Light medium gray, tan , cream gray, gray, very fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright yellow fluorescence, yellow green cut.
- 12970 – 13000 SILTSTONE: Light gray, medium gray, light gray, very fine to medium grained, argillaceous, carbonaceous, subrounded, interbedded limestone, medium gray, microcrystalline, mudstone to wackestone , poor to moderate induration, dull even yellow fluorescence, green yellow streaming cut.
- 13000 – 13030 SILTSTONE: Gray, dark gray, light gray, very fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright yellow fluorescence, instant bright blue cloudy broad streaming cut.
- 13030 – 13060 SILTSTONE: Gray, light gray, dark gray, fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even yellow fluorescence, instant bright blue milky cut
- 13060 – 13090 SILTSTONE: Dark gray, gray, light gray, very fine to medium grained, argillaceous, carbonaceous, subrounded, interbedded limestone, medium gray, microcrystalline, mudstone to wackestone , poor to moderate induration, even yellow fluorescence, instant bright blue milky streaming cut.
- 13090 – 13120 SILTSTONE: Light medium gray, tan , cream gray, gray, very fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright yellow fluorescence, yellow green cut.
- 13120 – 13150 SILTSTONE: Light gray, dark gray, gray, fine to medium grained, argillaceous, carbonaceous, subrounded, interbedded limestone, medium gray, microcrystalline, mudstone to wackestone , poor to moderate induration, even bright yellow fluorescence, instant bright blue milky cut.
- 13150 – 13180 SILTSTONE: Gray, light gray, dark gray, fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even yellow fluorescence, instant bright blue milky cut
- 13180 – 13210 SILTSTONE: Light medium gray, tan , cream gray, gray, very fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright yellow fluorescence, yellow green cut.
- 13210 – 13240 SILTSTONE: Light medium gray, tan , cream gray, gray, very fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright yellow fluorescence, yellow green cut.
- 13240 – 13270 SILTSTONE: Tan , cream gray, gray, light medium gray, very fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright yellow fluorescence, bright yellow green streaming cut.

- 13270 – 13300 SILTSTONE: Light medium gray, tan , cream gray, gray, very fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright yellow fluorescence, instant bright yellow green cut.
- 13300 – 13330 SILTSTONE: Tan , cream gray, gray, light medium gray, very fine to medium grained, argillaceous, carbonaceous, subrounded, poor induration, even bright yellow fluorescence, instant bright yellow streaming cut.
- 13330 – 13360 SILTSTONE: Cream gray, gray, tan, light medium gray, fine to medium grained, argillaceous, carbonaceous, subrounded, poor induration, even bright yellow fluorescence, instant bright yellow green streaming cut.
- 13360 – 13390 SILTSTONE: Tan , cream gray, gray, light medium gray, very fine to fine grained, argillaceous, carbonaceous, subrounded, poor induration, even bright yellow fluorescence, bright yellow green broad streaming cut.
- 13390 – 13420 SILTSTONE: Gray, light medium gray, tan , cream gray, very fine to fine grained, argillaceous, carbonaceous, subrounded, poor induration, even bright yellow fluorescence, instant bright yellow streaming cut.
- 13420 – 13450 SILTSTONE: Light medium gray, tan , cream gray, very fine to fine grained, argillaceous, carbonaceous, subrounded, poor induration, even bright yellow green fluorescence, instant bright yellow green broad streaming cut.
- 13450 – 13480 SILTSTONE: Tan , cream gray, light medium gray, very fine to fine grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright yellow green fluorescence, instant bright yellow green streaming cut.
- 13480 – 13510 SILTSTONE: Light medium gray, cream gray, tan, very fine to fine grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even yellow green fluorescence, bright blue streaming cut.
- 13510 – 13540 SILTSTONE: Cream gray, tan, light medium gray, very fine to fine grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even yellow green fluorescence, bright blue broad streaming cut.
- 13540 – 13570 SILTSTONE: Tan, light medium gray, cream gray, very fine to fine grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright yellow green fluorescence, bright blue broad streaming cut.
- 13570 – 13600 SILTSTONE: Cream gray, tan, light medium gray, very fine to fine grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright yellow green fluorescence, instant bright blue broad streaming cut.
- 13600 – 13630 SILTSTONE: Tan, light medium gray, cream gray, gray, light gray, very fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright green fluorescence, bright blue broad streaming cut.
- 13630 – 13660 SILTSTONE: Cream gray, tan, light medium gray, very fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright yellow green fluorescence, bright green blue streaming cut.
- 13660 – 13690 SILTSTONE: Tan, light medium gray, cream gray, very fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright yellow fluorescence, bright green blue cloudy streaming cut.

- 13690 – 13720 SILTSTONE: Cream gray, tan, light medium gray, very fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright yellow fluorescence, instant bright green blue milky streaming cut.
- 13720 – 13750 SILTSTONE: Tan, light medium gray, cream gray, gray, light gray, very fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright green fluorescence, bright blue broad streaming cut.
- 13750 – 13780 SILTSTONE: Tan, light medium gray, cream gray, very fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright yellow fluorescence, bright green blue cloudy streaming cut.
- 13780 – 13810 SILTSTONE: Cream gray, tan, light medium gray, very fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright yellow fluorescence, instant bright green blue milky streaming cut.
- 13810 – 13840 SILTSTONE: Cream gray, tan, light medium gray, very fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright yellow fluorescence, instant bright green blue milky streaming cut.
- 13840 – 13870 SILTSTONE: Light medium gray, gray, cream gray, very fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright yellow fluorescence, bright green blue cloudy streaming cut.
- 13870 – 13900 SILTSTONE: Tan, cream to medium gray, light gray, cream gray, very fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright yellow fluorescence, bright green blue cloudy streaming cut.
- 13900 – 13930 SILTSTONE: Cream to light gray, tan, medium gray, very fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright yellow fluorescence, instant yellow green milky streaming cut.
- 13930 – 13960 SILTSTONE: Gray to light cream, tan, light medium gray, very fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright yellow fluorescence, instant bright green blue milky streaming cut.
- 13960 – 13990 SILTSTONE: Cream gray, tan, light medium gray, very fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright yellow fluorescence, instant yellow green cut.
- 13990 – 14020 SILTSTONE: Light gray, cream to tan, light medium gray, very fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright yellow fluorescence, instant green blue milky streaming cut.
- 14020 – 14050 SILTSTONE: Light medium gray, tan, light medium gray, very fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, yellow fluorescence, instant yellow green milky streaming cut.
- 14050 – 14080 SILTSTONE: Gray, tan to cream, medium gray, very fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright yellow fluorescence, instant yellow green cut.
- 14080 – 14110 SILTSTONE: Light gray, cream to tan, light medium gray, very fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright yellow fluorescence, instant green blue milky streaming cut.

- 14110 – 14140 SILTSTONE: Light medium gray, tan to cream , gray to tan, very fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright yellow fluorescence, instant green blue milky streaming cut.
- 14140 – 14170 SILTSTONE: Gray, medium gray, cream to tan, light medium gray, very fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright yellow fluorescence, yellow green streaming cut.
- 14170 – 14200 SILTSTONE: Light medium gray, tan, medium cream, tan to cream, very fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright yellow fluorescence, instant green yellow milky streaming cut.
- 14200 – 14230 SILTSTONE: Cream gray, tan, light medium gray, very fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright yellow fluorescence, instant yellow green cut.
- 14230 – 14260 SILTSTONE: Light gray, cream to tan, light medium gray, very fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright yellow fluorescence, instant green blue milky streaming cut.
- 14260 – 14290 SILTSTONE: Light medium gray, tan, light medium gray, very fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, yellow fluorescence, instant yellow green milky streaming cut.
- 14290 – 14320 SILTSTONE: Gray, tan to cream, medium gray, very fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright yellow fluorescence, instant yellow green cut.
- 14320 – 14350 SILTSTONE: Light gray, cream to tan, light medium gray, very fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright yellow fluorescence, instant green blue milky streaming cut.
- 14350 – 14380 SILTSTONE: Gray, medium gray, cream to tan, light medium gray, very fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright yellow fluorescence, yellow green streaming cut.
- 14380 – 14410 SILTSTONE: Light medium gray, tan, medium cream, tan to cream, very fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright yellow fluorescence, instant green yellow milky streaming cut
- 14410 – 14440 SILTSTONE: Light gray, cream to tan, light medium gray, very fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright yellow fluorescence, instant green blue milky streaming cut.
- 14440 – 14470 SILTSTONE: Cream gray, tan, light medium gray, very fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright yellow fluorescence, instant yellow green cut.
- 14470 – 14500 SILTSTONE: Gray, medium gray, cream to tan, light medium gray, very fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright yellow fluorescence, yellow green streaming cut.

- 14500 – 14530 SILTSTONE: Light gray, cream to tan, light medium gray, very fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright yellow fluorescence, instant green blue milky streaming cut.
- 14530 – 14560 SILTSTONE: Light medium gray, tan, medium cream, tan to cream, very fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright yellow fluorescence, instant green yellow milky streaming cut
- 14560 – 14590 SILTSTONE: Light gray, cream to tan, light medium gray, very fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright yellow fluorescence, instant green blue milky streaming cut.
- 14590 – 14620 SILTSTONE: Cream to tan, light medium gray, light gray, very fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even yellow fluorescence, instant green blue cloudy streaming cut.
- 14620 – 14650 SILTSTONE: Light medium gray, light gray, cream to tan, very fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even yellow green fluorescence, instant bright green blue streaming cut.
- 14650 – 14680 SILTSTONE: Light gray, cream to tan, light medium gray, gray, dark gray, very fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright yellow green fluorescence, instant bright green blue broad streaming cut.
- 14680 – 14710 SILTSTONE: Dark gray, gray, light medium gray, light gray, cream to tan, very fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even yellow green fluorescence, bright green blue broad streaming cut.
- 14710 – 14740 SILTSTONE: Gray, dark gray, light medium gray, light gray, cream to tan, very fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even yellow fluorescence, bright green blue cut.
- 14740 – 14770 SILTSTONE: Dark gray, gray, light medium gray, light gray, cream to tan, very fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright yellow fluorescence, bright blue streaming cut.
- 14770 – 14800 SILTSTONE: Light medium gray, gray, dark gray, light gray, cream to tan, very fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright green yellow fluorescence, instant bright green blue broad streaming cut.
- 14800 – 14830 SILTSTONE: Gray, dark gray, light medium gray, light gray, cream to tan, very fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even green yellow fluorescence, bright green blue cloudy cut.
- 14830 – 14860 SILTSTONE: Dark gray, gray, light medium gray, light gray, cream to tan, very fine to fine grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright green yellow fluorescence, instant bright green blue milky streaming cut.
- 14860 – 14890 SILTSTONE: Light gray, dark gray, gray, light medium gray, cream to tan, very fine to fine grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright green yellow fluorescence, instant bright blue cloudy streaming cut.
- 14890 – 14920 SILTSTONE: Gray, dark gray, light gray, light medium gray, cream to tan, very fine to fine grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright green yellow fluorescence, instant bright blue milky pinpoint streaming cut.

- 14920 – 14950 SILTSTONE: Light gray, dark gray, gray, light medium gray, cream to tan, very fine to fine grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright green fluorescence, instant bright blue green milky streaming cut.
- 14950 – 14980 SILTSTONE: Dark gray, gray, light medium gray, light gray, cream to tan, very fine to fine grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright green fluorescence, bright blue green milky streaming cut.
- 14980 – 15010 SILTSTONE: Light gray, dark gray, gray, light medium gray, cream to tan, very fine grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright green yellow fluorescence, instant bright blue green milky cut.
- 15010 – 15040 SILTSTONE: Dark gray, light gray, gray, light medium gray, cream to tan, very fine grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright yellow fluorescence, instant bright blue milky broad streaming cut.
- 15040 – 15070 SILTSTONE: Light medium gray, light gray, cream to tan, very fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even yellow green fluorescence, instant bright green blue streaming cut.
- 15070 – 15100 SILTSTONE: Gray, dark gray, light gray, light medium gray, cream to tan, very fine to fine grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright green yellow fluorescence, instant bright blue milky pinpoint streaming cut.
- 15100 – 15130 SILTSTONE: Light gray, dark gray, gray, light medium gray, cream to tan, very fine grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright green yellow fluorescence, instant bright blue green milky cut.
- 15130 – 15160 SILTSTONE: Dark gray, light gray, gray, light medium gray, cream to tan, very fine grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright yellow fluorescence, instant bright blue milky broad streaming cut.
- 15160 – 15190 SILTSTONE: Tan to gray, light medium gray, gray, light medium gray, cream to tan, very fine grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright yellow fluorescence, instant bright blue milky broad streaming cut.
- 15190 – 15220 SILTSTONE: Gray to medium gray, light gray, gray, light medium gray, cream to tan, very fine grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright yellow fluorescence, instant bright blue milky broad streaming cut.
- 15220 – 15250 SILTSTONE: Light gray, dark gray, gray, light medium gray, cream to tan, very fine grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright green yellow fluorescence, instant bright blue green milky cut.
- 15250 – 15280 SILTSTONE: Dark gray, light gray, gray, light medium gray, cream to tan, very fine grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright yellow fluorescence, instant bright blue milky broad streaming cut.
- 15280 – 15310 SILTSTONE: Light medium gray, light gray, cream to tan, very fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even yellow green fluorescence, instant bright green blue streaming cut.

- 15310 – 15340 SILTSTONE: Gray, dark gray, light gray, light medium gray, cream to tan, very fine to fine grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright green yellow fluorescence, instant bright blue milky pinpoint streaming cut.
- 15340 – 15370 SILTSTONE: Light gray, dark gray, gray, light medium gray, cream to tan, very fine grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright green yellow fluorescence, instant bright blue green milky cut.
- 15370 – 15400 SILTSTONE: Light gray, dark gray, gray, light medium gray, cream to tan, very fine grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright green yellow fluorescence, instant bright blue green milky cut.
- 15400 – 15430 SILTSTONE: Light medium gray, light gray, cream to tan, very fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even yellow green fluorescence, instant bright green blue streaming cut.
- 15430 – 15460 SILTSTONE: Light gray, medium gray, cream to tan, very fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even yellow green fluorescence, instant bright green blue streaming cut.
- 15460 – 15490 SILTSTONE: Tan, light medium gray, gray, cream to tan, very fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even yellow green fluorescence, instant bright green blue streaming cut.
- 15490 – 15520 SILTSTONE: Gray, light medium gray, light gray, cream to tan, very fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even yellow green fluorescence, instant bright green blue streaming cut.
- 15520 – 15550 SILTSTONE: Light gray, dark gray, gray, light medium gray, cream to tan, very fine grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright green yellow fluorescence, instant bright blue green milky cut.
- 15550 – 15580 SILTSTONE: Light gray, medium gray, cream to tan, very fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even yellow green fluorescence, instant bright green blue streaming cut.
- 15580 – 15610 SILTSTONE: Tan, light medium gray, gray, cream to tan, very fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even yellow green fluorescence, instant bright green blue streaming cut.
- 15610 – 15640 SILTSTONE: Light gray, dark gray, gray, light medium gray, cream to tan, very fine grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright green yellow fluorescence, instant bright blue green milky cut.
- 15640 – 15670 SILTSTONE: Tan, light medium gray, gray, cream to tan, very fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even yellow green fluorescence, instant bright green blue streaming cut.
- 15670 – 15700 SILTSTONE: Light gray, medium gray, cream to tan, very fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even yellow green fluorescence, instant bright green blue streaming cut.
- 15700 – 15730 SILTSTONE: Light gray, dark gray, gray, light medium gray, cream to tan, very fine grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright green yellow fluorescence, instant bright blue green milky cut.

- 15730 – 15760 SILTSTONE: Dark gray, gray, light medium gray, light gray, cream to tan, very fine grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright green yellow fluorescence, instant bright blue milky cut.
- 15760 – 15790 SILTSTONE: Gray, dark gray, light medium gray, light gray, cream to tan, very fine grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright green yellow fluorescence, instant bright blue milky streaming cut.
- 15790 – 15820 SILTSTONE: Light medium gray, light gray, cream to tan, gray, dark gray, very fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright green yellow fluorescence, instant bright green blue milky streaming cut.
- 15820 – 15850 SILTSTONE: Light gray, cream to tan, gray, dark gray, light medium gray, very fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even yellow fluorescence, bright blue green milky streaming cut.
- 15850 – 15880 SILTSTONE: Light gray, cream to tan, gray, dark gray, light medium gray, very fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even yellow fluorescence, bright blue green milky streaming cut.
- 15880 – 15910 SILTSTONE: Light gray, medium gray, cream to tan, very fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even yellow green fluorescence, instant bright green blue streaming cut.
- 15910 – 15940 SILTSTONE: Light gray, dark gray, gray, light medium gray, cream to tan, very fine grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright green yellow fluorescence, instant bright blue green milky cut.
- 15940 – 15970 SILTSTONE: Dark gray, gray, light medium gray, light gray, cream to tan, very fine grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright green yellow fluorescence, instant bright blue milky cut.
- 15970 – 16000 SILTSTONE: Gray, dark gray, light medium gray, light gray, cream to tan, very fine grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright green yellow fluorescence, instant bright blue milky streaming cut.
- 16000 – 16030 SILTSTONE: Light medium gray, light gray, cream to tan, gray, dark gray, very fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright green yellow fluorescence, instant bright green blue milky streaming cut.
- 16030 – 16060 SILTSTONE: Light gray, cream to tan, gray, dark gray, light medium gray, very fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even yellow fluorescence, bright blue green milky streaming cut.
- 16060 – 16090 SILTSTONE: Light gray, cream to tan, gray, dark gray, light medium gray, very fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even yellow fluorescence, bright blue green milky streaming cut.
- 16090 – 16120 SILTSTONE: Light gray, medium gray, cream to tan, very fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even yellow green fluorescence, instant bright green blue streaming cut.

- 16120 – 16150 SILTSTONE: Light gray, dark gray, gray, light medium gray, cream to tan, very fine grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright green yellow fluorescence, instant bright blue green milky cut.
- 16150 – 16180 SILTSTONE: Dark gray, gray, light medium gray, light gray, cream to tan, very fine grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright green yellow fluorescence, instant bright blue milky cut.
- 16180 – 16210 SILTSTONE: Gray, dark gray, light medium gray, light gray, cream to tan, very fine grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright green yellow fluorescence, instant bright blue milky streaming cut.
- 16210 – 16240 SILTSTONE: Dark gray, gray, light medium gray, light gray, cream to tan, very fine grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright green yellow fluorescence, bright blue milky streaming cut.
- 16240 – 16270 SILTSTONE: Gray, dark gray, light medium gray, light gray, cream to tan, very fine to medium grained, argillaceous, carbonaceous, subrounded, moderate induration, even bright yellow fluorescence, bright blue milky streaming cut.
- 16270 – 16300 SILTSTONE: Dark gray, gray, light medium gray, light gray, cream to tan, very fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright green yellow fluorescence, bright blue milky streaming cut.
- 16300 – 16330 SILTSTONE: Red, gray, dark gray, light medium gray, light gray, cream to tan, very fine to medium grained, argillaceous, carbonaceous, subrounded, moderate sandstone, poor to well induration, even bright yellow fluorescence, bright blue green milky streaming cut.
- 16330 – 16360 SILTSTONE: Red, gray, dark gray, light medium gray, light gray, cream to tan, very fine to medium grained, argillaceous, carbonaceous, subrounded, moderate sandstone, poor to well induration, even bright green yellow fluorescence, bright blue green cloudy streaming cut.
- 16360 – 16390 SILTSTONE: Red, light medium gray, tan to brown, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, trace sandstone, fair to moderate induration, even yellow green yellow milky fluorescence, bright yellow green cut.
- 16390 – 16420 SILTSTONE: Red, light medium gray, tan to brown, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, trace sandstone, moderate to well induration, even yellow green fluorescence, bright yellow green cloudy cut.
- 16420 – 16450 SILTSTONE: Red, light medium gray, tan to brown, very fine to fine grained, carbonaceous, argillaceous, subrounded to rounded, trace sandstone, moderate to well induration, even bright yellow green fluorescence, bright yellow green cloudy streaming cut.
- 16450 – 16480 SILTSTONE: Gray, dark gray, red, light medium gray, tan to brown, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, trace sandstone, fair to moderate induration, even bright yellow green fluorescence, instant bright yellow green milky streaming cut.
- 16480 – 16510 SILTSTONE: Red, gray, dark gray, light medium gray, tan to brown, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, rare sandstone, moderate to well induration, even bright yellow fluorescence, bright green milky streaming cut.

- 16510 – 16540 SILTSTONE: Dark gray, gray, red, light medium gray, tan to brown, very fine to fine grained, carbonaceous, argillaceous, subrounded to rounded, rare sandstone, moderate induration, even yellow fluorescence, bright yellow green cloudy cut.
- 16540 – 16570 SILTSTONE: Gray, dark gray, gray, red, light medium gray, tan to brown, very fine to fine grained, carbonaceous, argillaceous, subrounded to rounded, rare sandstone, moderate induration, even yellow fluorescence, bright yellow green milky streaming cut.
- 16570 – 16600 SILTSTONE: Dark gray, gray, light medium gray, tan to brown, very fine to fine grained, carbonaceous, argillaceous, subrounded to rounded, moderate induration, even green yellow fluorescence, bright blue green milky streaming cut.
- 16600 – 16630 SILTSTONE: Dark gray, gray, light medium gray, red, tan to brown, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, moderate sandstone, moderate to well induration, even bright yellow fluorescence, instant bright yellow milky broad streaming cut.
- 16630 – 16660 SILTSTONE: Gray, dark gray, light medium gray, red, tan to brown, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, moderate sandstone, moderate to well induration, even bright green yellow fluorescence, instant bright yellow milky broad streaming cut.
- 16660 – 16690 SILTSTONE: Red, gray, dark gray, light medium gray, tan to brown, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, moderate sandstone, moderate to well induration, even green yellow fluorescence, bright yellow milky streaming cut.
- 16690 – 16720 SILTSTONE: Dark red, red, gray, dark gray, light medium gray, tan to brown, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, abundant sandstone, moderate to well induration, even green yellow fluorescence, instant bright yellow milky streaming cut.
- 16720 – 16750 SILTSTONE: Red, dark red, gray, dark gray, light medium gray, tan to brown, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, abundant sandstone, moderate to well induration, even bright green yellow fluorescence, instant bright yellow milky broad streaming cut.
- 16750 – 16780 SILTSTONE: Dark red, red, gray, dark gray, light medium gray, tan to brown, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, abundant sandstone, moderate to well induration, even green yellow fluorescence, bright yellow green milky streaming cut.
- 16780 – 16810 SILTSTONE: Red, dark red, gray, dark gray, light medium gray, tan to brown, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, abundant sandstone, moderate to well induration, even bright green yellow fluorescence, instant bright yellow milky broad streaming cut.
- 16810 – 16840 SILTSTONE: Red to dark red, grey, light medium gray, dark gray, light medium gray, tan to brown, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, trace sandstone, moderate to well induration, even bright green yellow fluorescence, instant yellow milky cut.
- 16840 – 16870 SILTSTONE: Red, tan to red, cream, tan to brown, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, trace sandstone, moderate to well induration, green yellow fluorescence, even green yellow cut.

- 16870 – 16900 SILTSTONE: Red, medium red, gray, light gray, light medium gray, tan to brown, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, interbedded sandstone, moderate to well induration, bright green yellow fluorescence, instant yellow milky broad streaming cut.
- 16900 – 16930 SILTSTONE: Dark red, red, gray, dark gray, light medium gray, tan to brown, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, trace sandstone, moderate to well induration, even green yellow fluorescence, bright yellow green milky streaming cut.
- 16930 – 16960 SILTSTONE: Red, tan to gray, cream to tan dark gray, light medium gray, tan to brown, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, trace sandstone, moderate to well induration, even green yellow fluorescence, instant yellow green milky cut.
- 16960 – 16990 SILTSTONE: Gray to medium red, red to tan , gray, dark gray, light medium gray, tan to brown, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, trace sandstone, moderate to well induration, even green yellow fluorescence, bright yellow green milky streaming cut.
- 16990 – 17020 SILTSTONE: Red, tan to gray, cream to tan dark gray, light medium gray, tan to brown, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, trace sandstone, moderate to well induration, even green yellow fluorescence, instant yellow green milky cut.
- 17020 – 17050 SILTSTONE: Red, dark red, gray, dark gray, light medium gray, tan to brown, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, abundant sandstone, moderate to well induration, even bright green yellow fluorescence, instant bright yellow milky broad streaming cut.
- 17050 – 17080 SILTSTONE: Red to dark red, grey, light medium gray, dark gray, light medium gray, tan to brown, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, trace sandstone, moderate to well induration, even bright green yellow fluorescence, instant yellow milky cut.
- 17080 – 17110 SILTSTONE: Red to dark red, grey, light medium gray, dark gray, light medium gray, tan to brown, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, trace sandstone, moderate to well induration, even bright green yellow fluorescence, instant yellow milky cut.
- 17110 – 17140 SILTSTONE: Red, tan to red, cream, tan to brown, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, trace sandstone, moderate to well induration, green yellow fluorescence, even green yellow cut.
- 17140 – 17170 SILTSTONE: Red, medium red, gray, light gray, light medium gray, tan to brown, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, interbedded sandstone, moderate to well induration, bright green yellow fluorescence, instant yellow milky broad streaming cut.
- 17170 – 17200 SILTSTONE: Dark red, red, gray, dark gray, light medium gray, tan to brown, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, trace sandstone, moderate to well induration, even green yellow fluorescence, bright yellow green milky streaming cut.

- 17200 – 17230 SILTSTONE: Red, tan to gray, cream to tan dark gray, light medium gray, tan to brown, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, trace sandstone, moderate to well induration, even green yellow fluorescence, instant yellow green milky cut.
- 17230 – 17260 SILTSTONE: Gray to medium red, red to tan , gray, dark gray, light medium gray, tan to brown, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, trace sandstone, moderate to well induration, even green yellow fluorescence, bright yellow green milky streaming cut.
- 17260 – 17290 SILTSTONE: Red, tan to gray, cream to tan dark gray, light medium gray, tan to brown, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, trace sandstone, moderate to well induration, even green yellow fluorescence, instant yellow green milky cut.
- 17290 – 17320 SILTSTONE: Red, tan to gray, cream to tan dark gray, light medium gray, tan to brown, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, trace sandstone, moderate to well induration, even green yellow fluorescence, instant yellow green milky cut.
- 17320 – 17350 SILTSTONE: Red to dark red, grey, light medium gray, dark gray, light medium gray, tan to brown, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, trace sandstone, moderate to well induration, even bright green yellow fluorescence, instant yellow milky cut.
- 17350 – 17380 SILTSTONE: Red to dark red, grey, light medium gray, dark gray, light medium gray, tan to brown, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, trace sandstone, moderate to well induration, even bright green yellow fluorescence, instant yellow milky cut.
- 17380 – 17410 SILTSTONE: Red to dark red, grey, light medium gray, dark gray, light medium gray, tan to brown, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, trace sandstone, moderate to well induration, even bright green yellow fluorescence, instant yellow milky cut.
- 17410 – 17440 SILTSTONE: Red to dark red, grey, light medium gray, dark gray, light medium gray, tan to brown, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, trace sandstone, moderate to well induration, even bright green yellow fluorescence, instant yellow milky cut.
- 17440 – 17470 SILTSTONE: Gray, red to dark red, light medium gray, dark gray, light medium gray, tan to brown, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, trace sandstone, moderate to well induration, even bright green yellow fluorescence, instant bright yellow milky streaming cut.
- 17470 – 17500 SILTSTONE: Red to dark red, grey, light medium gray, dark gray, light medium gray, tan to brown, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, trace sandstone, moderate to well induration, even bright yellow fluorescence, instant bright green yellow milky streaming cut.
- 17500 – 17530 SILTSTONE: Light medium gray, red to dark red, grey, dark gray, light medium gray, tan to brown, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, trace sandstone, moderate to well induration, even bright green yellow fluorescence, instant bright yellow milky broad streaming cut.

- 17530 – 17560 SILTSTONE: Red to dark red, grey, light medium gray, dark gray, tan to brown, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, trace sandstone, moderate to well induration, even bright yellow fluorescence, instant bright yellow milky streaming cut.
- 17560 – 17590 SILTSTONE: Light medium gray, red to dark red, grey, dark gray, tan to brown, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, trace sandstone, moderate to well induration, even green yellow fluorescence, bright green yellow milky streaming cut.
- 17590 – 17620 SILTSTONE: Dark gray, light medium gray, red to dark red, grey, tan to brown, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, trace sandstone, moderate to well induration, even bright green yellow fluorescence, bright blue green milky streaming cut.
- 17620 – 17650 SILTSTONE: Red to dark red, dark gray, light medium gray, grey, tan to brown, very fine to fine grained, carbonaceous, argillaceous, subrounded to rounded, trace sandstone, moderate to well induration, even bright green yellow fluorescence, bright blue milky streaming cut.
- 17650 – 17680 SILTSTONE: Dark gray, light medium gray, grey, tan to brown, red to dark red, very fine to fine grained, carbonaceous, argillaceous, subrounded to rounded, trace sandstone, moderate to well induration, even bright green yellow fluorescence, bright blue milky broad streaming cut.
- 17680 – 17710 SILTSTONE: Red to dark red, dark gray, light medium gray, grey, tan to brown, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, trace sandstone, moderate to well induration, even bright green yellow fluorescence, instant bright blue green milky broad streaming cut.
- 17710 – 17740 SILTSTONE: Light medium gray, grey, tan to brown, red to dark red, dark gray, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, trace sandstone, moderate to well induration, even bright yellow fluorescence, instant bright blue green milky broad streaming cut.
- 17740 – 17770 SILTSTONE: Red to dark red, dark gray, light medium gray, grey, tan to brown, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, trace sandstone, moderate to well induration, even bright green yellow fluorescence, bright yellow green milky streaming cut.
- 17770 – 17800 SILTSTONE: Grey, tan to brown, red to dark red, dark gray, light medium gray, very fine to fine grained, carbonaceous, argillaceous, subrounded to rounded, trace sandstone, moderate to well induration, even bright green yellow fluorescence, bright blue green milky streaming cut.
- 17800 – 17830 SILTSTONE: Red to dark red, dark gray, light medium gray, grey, tan to brown, very fine to fine grained, carbonaceous, argillaceous, subrounded to rounded, trace sandstone, moderate to well induration, even bright yellow fluorescence, instant bright yellow green milky streaming cut.
- 17830 – 17860 SILTSTONE: Light medium gray, grey, red to dark red, dark gray, tan to brown, very fine to fine grained, carbonaceous, argillaceous, subrounded to rounded, trace sandstone, moderate to well induration, even bright yellow green fluorescence, instant bright blue green milky streaming cut.

- 17860 – 17890 SILTSTONE: Red to dark red, dark gray, light medium gray, grey, tan to brown, very fine to fine grained, carbonaceous, argillaceous, subrounded to rounded, trace sandstone, moderate to well induration, even bright yellow green fluorescence, instant bright blue green milky broad streaming cut.
- 17890 – 17920 SILTSTONE: Dark gray, light medium gray, gray, light gray, tan to brown, very fine to fine grained, carbonaceous, argillaceous, subrounded to rounded, moderate induration, even bright yellow green fluorescence, instant bright blue green milky streaming cut.
- 17920 – 17950 SILTSTONE: Gray, light gray, tan to brown, dark gray, light medium gray, very fine to fine grained, carbonaceous, argillaceous, subrounded to rounded, moderate induration, even bright yellow green fluorescence, bright blue milky streaming cut.
- 17950 – 17980 SILTSTONE: Dark gray, light medium gray, grey, tan to brown, red to dark red, very fine to fine grained, carbonaceous, argillaceous, subrounded to rounded, moderate sandstone, moderate to well induration, even bright green yellow fluorescence, bright blue milky streaming cut.
- 17980 – 18010 SILTSTONE: Red to dark red, dark gray, light medium gray, grey, tan to brown, very fine to fine grained, carbonaceous, argillaceous, subrounded to rounded, moderate sandstone, moderate to well induration, even bright green yellow fluorescence, instant bright blue milky streaming cut.
- 18010 – 18040 SILTSTONE: Light medium gray, grey, red to dark red, dark gray, tan to brown, very fine to fine grained, carbonaceous, argillaceous, subrounded to rounded, trace sandstone, moderate to well induration, even bright yellow green fluorescence, instant bright blue green milky streaming cut.
- 18040 – 18070 SILTSTONE: Light medium gray, grey, red to dark red, dark gray, tan to brown, very fine to fine grained, carbonaceous, argillaceous, subrounded to rounded, trace sandstone, moderate to well induration, even bright yellow green fluorescence, instant bright blue green milky streaming cut.
- 18070 – 18100 SILTSTONE: Dark gray, light medium gray, gray, light gray, tan to brown, very fine to fine grained, carbonaceous, argillaceous, subrounded to rounded, moderate induration, even bright yellow green fluorescence, instant bright blue green milky streaming cut.
- 18100 – 18130 SILTSTONE: Dark gray, light medium gray, gray, light gray, tan to brown, very fine to fine grained, carbonaceous, argillaceous, subrounded to rounded, moderate induration, even bright yellow green fluorescence, instant bright blue green milky streaming cut.
- 18130 – 18160 SILTSTONE: Red to dark red, dark gray, light medium gray, grey, tan to brown, very fine to fine grained, carbonaceous, argillaceous, subrounded to rounded, moderate sandstone, moderate to well induration, even bright green yellow fluorescence, instant bright blue milky streaming cut.
- 18160 – 18190 SILTSTONE: Red to dark red, dark gray, light medium gray, grey, tan to brown, very fine to fine grained, carbonaceous, argillaceous, subrounded to rounded, moderate sandstone, moderate to well induration, even bright green yellow fluorescence, instant bright blue milky streaming cut.
- 18190 – 18220 SILTSTONE: Light medium gray, grey, red to dark red, dark gray, tan to brown, very fine to fine grained, carbonaceous, argillaceous, subrounded to rounded, trace sandstone, moderate to well induration, even bright yellow green fluorescence, instant bright blue green milky streaming cut.

- 18220 – 18250 SILTSTONE: Gray to medium red, red to tan , gray, dark gray, light medium gray, tan to brown, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, trace sandstone, moderate to well induration, even green yellow fluorescence, bright yellow green milky streaming cut.
- 18250 – 18280 SILTSTONE: Light to medium red, red to tan , gray, dark gray, light medium gray, tan to brown, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, trace sandstone, moderate to well induration, even green yellow fluorescence, bright yellow green milky streaming cut.
- 18280 – 18310 SILTSTONE: Light gray, medium red, red to tan , medium gray, dark gray, light medium gray, tan to brown, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, trace sandstone, moderate to well induration, even green yellow fluorescence, yellow green milky cut.
- 18310 – 18340 SILTSTONE: Tan, medium gray to medium red, red to tan , gray, dark gray, light medium gray, tan to brown, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, trace sandstone, moderate to well induration, even green yellow fluorescence, bright yellow green milky streaming cut.
- 18340 – 18370 SILTSTONE: Gray, light gray to medium red, red to tan , gray, dark gray, light medium gray, tan to brown, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, trace sandstone, moderate to well induration, even green yellow fluorescence, yellow green milky cut.
- 18370 – 18400 SILTSTONE: Gray to medium red, red to tan , gray, dark gray, light medium gray, tan to brown, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, trace sandstone, moderate to well induration, even green yellow fluorescence, bright yellow green milky streaming cut.
- 18400 – 18430 SILTSTONE: Light medium gray, grey, red to dark red, dark gray, tan to brown, very fine to fine grained, carbonaceous, argillaceous, subrounded to rounded, trace sandstone, moderate to well induration, even bright yellow green fluorescence, instant bright blue green milky streaming cut.
- 18430 – 18460 SILTSTONE: Gray to medium red, red to tan , gray, dark gray, light medium gray, tan to brown, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, trace sandstone, moderate to well induration, even green yellow fluorescence, bright yellow green milky streaming cut.
- 18460 – 18490 SILTSTONE: Light to medium red, red to tan , gray, dark gray, light medium gray, tan to brown, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, trace sandstone, moderate to well induration, even green yellow fluorescence, bright yellow green milky streaming cut.
- 18490 – 18520 SILTSTONE: Light gray, medium red, red to tan , medium gray, dark gray, light medium gray, tan to brown, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, trace sandstone, moderate to well induration, even green yellow fluorescence, yellow green milky cut.
- 18520 – 18550 SILTSTONE: Tan, medium gray to medium red, red to tan , gray, dark gray, light medium gray, tan to brown, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, trace sandstone, moderate to well induration, even green yellow fluorescence, bright yellow green milky streaming cut.

- 18550 – 18580 SILTSTONE: Light to medium red, red to tan , gray, dark gray, light medium gray, tan to brown, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, trace sandstone, moderate to well induration, even green yellow fluorescence, bright yellow green milky streaming cut.
- 18580 – 18610 SILTSTONE: Light to medium red, red to tan , gray, dark gray, light medium gray, tan to brown, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, trace sandstone, moderate to well induration, even green yellow fluorescence, bright yellow green milky streaming cut.
- 18610 – 18640 SILTSTONE: Red to tan , gray, dark gray, light medium gray, tan to brown, light to medium red, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, trace sandstone, moderate to well induration, even bright yellow fluorescence, instant bright yellow green milky streaming cut.
- 18640 – 18670 SILTSTONE: Gray, dark gray, light medium gray, tan to brown, red to tan , light to medium red, very fine to fine grained, carbonaceous, argillaceous, subrounded to rounded, trace sandstone, moderate to well induration, even bright yellow fluorescence, instant bright yellow cloudy streaming cut.
- 18670 – 18700 SILTSTONE: Red to tan , gray, dark gray, light medium gray, tan to brown, light to medium red, very fine to fine grained, carbonaceous, argillaceous, subrounded to rounded, moderate sandstone, moderate to well induration, even bright green yellow fluorescence, instant bright blue green milky streaming cut.
- 18700 – 18730 SILTSTONE: Light medium gray, red to tan , gray, dark gray, tan to brown, light to medium red, very fine to fine grained, carbonaceous, argillaceous, subrounded to rounded, moderate sandstone, moderate to well induration, even bright green yellow fluorescence, instant bright blue green milky broad streaming cut.
- 18730 – 18760 SILTSTONE: Red to dark red, light medium gray, gray, dark gray, tan to brown, very fine to fine grained, carbonaceous, argillaceous, subrounded to rounded, moderate sandstone, moderate to well induration, even bright green yellow fluorescence, instant bright blue green milky streaming cut.
- 18760 – 18790 SILTSTONE: Dark gray, tan to brown, red to dark red, light medium gray, gray, very fine to fine grained, carbonaceous, argillaceous, subrounded to rounded, moderate sandstone, moderate to well induration, even bright yellow fluorescence, instant bright blue milky streaming cut.
- 18790 – 18820 SILTSTONE: Red to dark red, light medium gray, gray, dark gray, tan to brown, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, moderate sandstone, moderate to well induration, even bright green yellow fluorescence, instant bright blue milky broad streaming cut.
- 18820 – 18850 SILTSTONE: Dark gray, tan to brown, red to dark red, light medium gray, gray, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, moderate sandstone, moderate to well induration, even bright green yellow fluorescence, instant bright blue green milky broad streaming cut.
- 18850 – 18880 SILTSTONE: Red to dark red, light medium gray, gray, dark gray, tan to brown, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, moderate sandstone, moderate to well induration, even bright yellow green fluorescence, instant bright blue green milky streaming cut.

- 18880 – 18910 SILTSTONE: Gray, dark gray, tan to brown, red to dark red, light medium gray, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, moderate sandstone, moderate to well induration, even bright yellow green fluorescence, instant bright yellow green milky streaming cut.
- 18910 – 18940 SILTSTONE: Red to dark red, gray, dark gray, tan to brown, light medium gray, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, moderate sandstone, moderate to well induration, even bright yellow fluorescence, instant bright yellow green milky broad streaming cut.
- 18940 – 18970 SILTSTONE: Gray, dark gray, red to dark red, tan to brown, light medium gray, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, trace sandstone, moderate to well induration, even bright yellow fluorescence, instant bright yellow milky broad streaming cut.
- 18970 – 19000 SILTSTONE: Red to dark red, gray, dark gray, tan to brown, light medium gray, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, rare sandstone, moderate to well induration, even bright yellow green fluorescence, instant bright green yellow milky streaming cut.
- 19000 – 19030 SILTSTONE: Tan to brown, light medium gray, red to dark red, gray, dark gray, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, rare sandstone, moderate to well induration, even bright yellow fluorescence, bright green yellow milky streaming cut.
- 19030 – 19060 SILTSTONE: Gray, dark gray, tan to brown, light medium gray, red to dark red, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, rare sandstone, moderate to well induration, even bright yellow green fluorescence, instant bright green yellow green milky streaming cut.
- 19060 – 19090 SILTSTONE: Red to dark red, gray, dark gray, tan to brown, light medium gray, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, rare sandstone, moderate to well induration, even bright yellow green fluorescence, instant bright blue green milky streaming cut.
- 19090 – 19120 SILTSTONE: Red to dark red, gray, dark gray, tan to brown, light medium gray, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, rare sandstone, moderate to well induration, even bright yellow green fluorescence, instant bright green yellow milky streaming cut.
- 19120 – 19150 SILTSTONE: Red to dark red, gray, dark gray, tan to brown, light medium gray, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, rare sandstone, moderate to well induration, even bright yellow green fluorescence, instant bright green yellow milky streaming cut.
- 19150 – 19180 SILTSTONE: Gray, dark gray, red to dark red, tan to brown, light medium gray, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, trace sandstone, moderate to well induration, even bright yellow fluorescence, instant bright yellow milky broad streaming cut.
- 19180 – 19210 SILTSTONE: Gray, dark gray, red to dark red, tan to brown, light medium gray, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, trace sandstone, moderate to well induration, even bright yellow fluorescence, instant bright yellow milky broad streaming cut.

- 19210 – 19240 SILTSTONE: Tan to brown, light medium gray, red to dark red, gray, dark gray, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, rare sandstone, moderate to well induration, even bright yellow fluorescence, bright green yellow milky streaming cut.
- 19240 – 19270 SILTSTONE: Tan to brown, light medium gray, red to dark red, gray, dark gray, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, rare sandstone, moderate to well induration, even bright yellow fluorescence, bright green yellow milky streaming cut.
- 19270 – 19300 SILTSTONE: Tan to brown, light medium gray, red to dark red, gray, dark gray, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, rare sandstone, moderate to well induration, even bright yellow fluorescence, bright green yellow milky streaming cut.
- 19300 – 19330 SILTSTONE: Gray, dark gray, tan to brown, light medium gray, red to dark red, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, rare sandstone, moderate to well induration, even bright yellow green fluorescence, instant bright green yellow green milky streaming cut.
- 19330 – 19360 SILTSTONE: Red to dark red, gray, dark gray, tan to brown, light medium gray, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, rare sandstone, moderate to well induration, even bright yellow green fluorescence, instant bright blue green milky streaming cut.
- 19360 – 19390 SILTSTONE: Red to dark red, gray, dark gray, tan to brown, light medium gray, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, rare sandstone, moderate to well induration, even bright yellow green fluorescence, instant bright green yellow milky streaming cut.
- 19390 – 19420 SILTSTONE: Red to dark red, gray, dark gray, tan to brown, light medium gray, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, rare sandstone, moderate to well induration, even bright yellow green fluorescence, instant bright green yellow milky streaming cut.
- 19420 – 19450 SILTSTONE: Gray, dark gray, red to dark red, tan to brown, light medium gray, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, trace sandstone, moderate to well induration, even bright yellow fluorescence, instant bright yellow milky broad streaming cut.
- 19450 – 19480 SILTSTONE: Gray, dark gray, red to dark red, tan to brown, light medium gray, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, trace sandstone, moderate to well induration, even bright yellow fluorescence, instant bright yellow milky broad streaming cut.
- 19480 – 19510 SILTSTONE: Tan to brown, light medium gray, red to dark red, gray, dark gray, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, rare sandstone, moderate to well induration, even bright yellow fluorescence, bright green yellow milky streaming cut.
- 19510 – 19540 SILTSTONE: Tan to brown, light medium gray, red to dark red, gray, dark gray, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, rare sandstone, moderate to well induration, even bright yellow fluorescence, bright green yellow milky streaming cut.

- 19540 – 19570 SILTSTONE: Tan to brown, light medium gray, red to dark red, gray, dark gray, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, rare sandstone, moderate to well induration, even bright yellow fluorescence, bright green yellow milky streaming cut.
- 19570 – 19600 SILTSTONE: Tan to brown, light medium gray, red to dark red, gray, dark gray, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, rare sandstone, moderate to well induration, even bright yellow fluorescence, bright yellow milky streaming cut.
- 19600 – 19630 SILTSTONE: Tan to brown, light medium gray, red to dark red, gray, dark gray, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, rare sandstone, moderate to well induration, even bright yellow fluorescence, bright green yellow cloudy streaming cut.
- 19630 – 19660 SILTSTONE: Gray, dark gray, tan to brown, light medium gray, red to dark red, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, rare sandstone, moderate to well induration, even bright yellow green fluorescence, instant bright yellow green milky streaming cut.
- 19660 – 19690 SILTSTONE: Tan to brown, light medium gray, red to dark red, gray, dark gray, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, rare sandstone, moderate to well induration, even bright yellow fluorescence, bright green yellow milky streaming cut.
- 19690 – 19720 SILTSTONE: Gray, dark gray, tan to brown, light medium gray, red to dark red, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, rare sandstone, moderate to well induration, even bright yellow green fluorescence, instant bright green yellow green milky streaming cut.
- 19720 – 19750 SILTSTONE: Gray, dark gray, tan to brown, light medium gray, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, trace sandstone, moderate to well induration, even bright yellow fluorescence, instant bright yellow milky broad streaming cut.
- 19750 – 19780 SILTSTONE: Gray, dark gray, tan to brown, light medium gray, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, trace sandstone, moderate to well induration, even dull yellow fluorescence, dim yellow cut.
- 19780 – 19810 SILTSTONE: Gray, dark gray, tan to brown, light medium gray, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, trace sandstone, moderate to well induration, bright spotted yellow fluorescence, bright yellow pin point streaming cut.
- 19810 – 19840 SILTSTONE: Gray, dark gray, tan to brown, light medium gray, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, trace sandstone, moderate to well induration, even yellow fluorescence, bright yellow/green pin point streaming cut.
- 19840 – 19870 SILTSTONE: Gray, dark gray, tan to brown, light medium gray, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, trace sandstone, moderate to well induration, scattered yellow fluorescence, moderate yellow pin point streaming cut.

- 19870 – 19900 SILTSTONE: Gray, dark gray, tan to brown, light medium gray, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, trace sandstone, moderate to well induration, spotted yellow fluorescence, bright yellow/green pin point streaming cut.
- 19900 – 19930 SILTSTONE: Gray, dark gray, tan to brown, light medium gray, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, trace sandstone, moderate to well induration, even yellow fluorescence, yellow pin point streaming cut.
- 19930 – 19960 SILTSTONE: Gray, light gray, tan to brown, light medium gray, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, trace sandstone, moderate to well induration, spotted yellow fluorescence, bright yellow pin point streaming cut.
- 19960 – 19990 SILTSTONE: Gray, light gray, tan to brown, light medium gray, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, trace sandstone, moderate to well induration, scattered yellow fluorescence, moderate yellow streaming cut.
- 19990 – 20020 SILTSTONE: Gray, light gray, tan to brown, light medium gray, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, trace sandstone, moderate to well induration, spotted yellow fluorescence, cloudy yellow broad streaming cut.
- 20020 – 20050 SILTSTONE: Gray, light gray, tan to brown, light medium gray, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, trace sandstone, moderate to well induration, even yellow fluorescence, milky yellow pin point streaming cut.
- 20050 – 20080 SILTSTONE: Gray, light gray, tan to brown, light medium gray, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, trace sandstone, moderate to well induration, scattered yellow fluorescence, bright yellow pin point streaming cut.
- 20080 – 20110 SILTSTONE: Gray, light gray, tan to brown, light medium gray, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, trace sandstone, moderate to well induration, spotted yellow fluorescence, yellow pin point streaming cut.
- 20110 – 20140 SILTSTONE: Gray, light gray, tan to brown, light medium gray, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, trace sandstone, moderate to well induration, even yellow fluorescence, yellow pin point streaming cut.
- 20140 – 20170 SILTSTONE: Gray, light gray, tan to brown, light medium gray, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, trace sandstone, moderate to well induration, even yellow fluorescence, milky yellow pin point streaming cut.
- 20170 – 20200 SILTSTONE: Tan to brown, light medium gray, red to dark red, gray, dark gray, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, rare sandstone, moderate to well induration, even bright yellow fluorescence, bright green yellow cloudy streaming cut.
- 20200 – 20230 SILTSTONE: Tan to brown, light medium gray, red to dark red, gray, dark gray, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, rare sandstone, moderate to well induration, even bright yellow fluorescence, bright green yellow cloudy streaming cut.
- 20230 – 20260 SILTSTONE: Dark gray, tan to brown, red to dark red, light medium gray, gray, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, moderate sandstone, moderate to well induration, even bright green yellow fluorescence, instant bright blue green milky broad streaming cut.

- 20260 – 20290 SILTSTONE: Dark gray, tan to brown, red to dark red, light medium gray, gray, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, moderate sandstone, moderate to well induration, even bright green yellow fluorescence, instant bright blue green milky broad streaming cut.
- 20290 – 20320 SILTSTONE: Gray, dark gray, tan to brown, red to dark red, light medium gray, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, moderate sandstone, moderate to well induration, even bright yellow green fluorescence, instant bright yellow green milky streaming cut.
- 20320 – 20350 SILTSTONE: Gray, light gray, tan to brown, light medium gray, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, trace sandstone, moderate to well induration, even yellow fluorescence, yellow pin point streaming cut.
- 20350 – 20380 SILTSTONE: Light medium gray, tan, medium cream, tan to cream, very fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright yellow fluorescence, instant green yellow milky streaming cut.
- 20380 – 20410 SILTSTONE: Cream gray, tan, light medium gray, very fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright yellow fluorescence, instant yellow green cut.
- 20140 – 20440 SILTSTONE: Light gray, cream to tan, light medium gray, very fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright yellow fluorescence, instant green blue milky streaming cut.
- 10440 – 20470 SILTSTONE: Light gray, cream to tan, light medium gray, very fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright yellow fluorescence, instant green blue milky streaming cut.
- 20470 – 20500 SILTSTONE: Light medium gray, tan, light medium gray, very fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, yellow fluorescence, instant yellow green milky streaming cut.
- 20500 – 20530 SILTSTONE: Light medium gray, tan, light medium gray, very fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, yellow fluorescence, instant yellow green milky streaming cut.
- 20530 – 20560 SILTSTONE: Gray, tan to cream, medium gray, very fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright yellow fluorescence, instant yellow green cut.
- 20560 – 20590 SILTSTONE: Gray, tan to cream, medium gray, very fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright yellow fluorescence, instant yellow green cut.
- 20590 – 20620 SILTSTONE: Light gray, cream to tan, light medium gray, very fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright yellow fluorescence, instant green blue milky streaming cut.
- 20620 – 20650 SILTSTONE: Light gray, cream to tan, light medium gray, very fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright yellow fluorescence, instant green blue milky streaming cut.

- 20650 – 20680 SILTSTONE: Cream gray, gray, tan, light medium gray, fine to medium grained, argillaceous, carbonaceous, subrounded, poor induration, even bright yellow fluorescence, instant bright yellow green streaming cut.
- 20680 – 20710 SILTSTONE: Cream gray, gray, tan, light medium gray, fine to medium grained, argillaceous, carbonaceous, subrounded, poor induration, even bright yellow fluorescence, instant bright yellow green streaming cut.
- 20710 – 20740 SILTSTONE: Gray, tan to cream, medium gray, very fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright yellow fluorescence, instant yellow green cut.
- 20740 – 20770 SILTSTONE: Light gray, cream to tan, light medium gray, very fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright yellow fluorescence, instant green blue milky streaming cut.
- 20770 – 20800 SILTSTONE: Light medium gray, tan to cream, light gray, very fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright yellow fluorescence, instant green blue milky streaming cut.
- 20800 – 20830 SILTSTONE: Light gray, cream to tan, light medium gray, very fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright yellow fluorescence, instant green blue milky streaming cut.
- 20830 – 20860 SILTSTONE: Gray, light gray, tan to brown, light medium gray, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, trace sandstone, moderate to well induration, even yellow fluorescence, yellow pin point streaming cut.
- 20860 – 20890 SILTSTONE: Light medium gray, tan, light medium gray, very fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, yellow fluorescence, instant yellow green milky streaming cut.
- 20890 – 20920 SILTSTONE: Gray, light gray, tan to brown, light medium gray, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, trace sandstone, moderate to well induration, even yellow fluorescence, yellow pin point streaming cut.
- 20920 – 20950 SILTSTONE: Light medium gray, tan, medium cream, tan to cream, very fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright yellow fluorescence, instant green yellow milky streaming cut.
- 20950 – 20980 SILTSTONE: Light medium gray, tan, light medium gray, very fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, yellow fluorescence, instant yellow green milky streaming cut.
- 20980 – 21010 SILTSTONE: Gray, tan to cream, medium gray, very fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright yellow fluorescence, instant yellow green cut.
- 21010 – 21040 SILTSTONE: Gray, light gray, tan to brown, light medium gray, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, trace sandstone, moderate to well induration, spotted yellow fluorescence, yellow pin point streaming cut.
- 21040 – 21070 SILTSTONE: Cream gray, gray, tan, light medium gray, fine to medium grained, argillaceous, carbonaceous, subrounded, poor induration, even bright yellow fluorescence, instant bright yellow green streaming cut.

- 21070 – 21100 SILTSTONE: Gray, tan to cream, medium gray, very fine to medium grained, argillaceous, carbonaceous, subrounded, poor to moderate induration, even bright yellow fluorescence, instant yellow green cut.
- 21100 – 21130 SILTSTONE: Gray, light gray, tan to brown, light medium gray, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, trace sandstone, moderate to well induration, spotted yellow fluorescence, yellow pin point streaming cut.
- 21130 – 21151 SILTSTONE: Gray, light gray, tan to brown, light medium gray, very fine to medium grained, carbonaceous, argillaceous, subrounded to rounded, trace sandstone, moderate to well induration, even yellow fluorescence, yellow pin point streaming cut.

TD OF LATERAL WAS CALLED AT 21,151' MD AT 1:15 AM MCT ON SEPTEMBER 10, 2011

Partner Well Information Requiriements



OXY USA WTP LP

OXY USA Inc.

Subsidiaries of Occidental Petroleum Corporation

Williston Business Unit

7/12/2011

Well Name MARLENE STEFFAN 1-5-8H-141-97
Location Section 5 and 8, T141N-R97W
County, ST Dunn County, ND
Rig Precision 426

Send to: Geology, Drilling,
Production, and Regulatory

NORTHERN OIL AND GAS, INC.

315 Manitoba Ave., Suite 200, Wayzata MN 55391

Michael Reger - CEO

Kruise Kemp - Land Manager

Phone: (953)476-9800

Fax: (952)476-9801

mreger@northernoil.com

kkemp@northernoil.com

production@northernoil.com

* Please continue to email daily oil, gas and water production information for at least three months following completion of the well.

Regulatory Forms	Plat	Daily Drill /Comp	Mud Logs	Final Logs	LAS	DST, Core Reports
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MARK FLIGINGER

1532 Schooner Place, Bismarck, ND 58504

Phone: (701)255-7876

Fax: (701)255-2007

flick.codyoil@midconetwork.com

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WEPCO ENERGY, LLC

12943 Horizon Trail, Castle Rock, CO 80108

Phone: (303)771-8551

Richard K. Ellis, President

rkellis@qwestoffice.net

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Continental Resources, Inc.

P.O. Box 1032, Enid OK 73707

Kathryn Atchison, Manager of Oustide Operations

Phone: (580)548-5180

Neil Oleson, Geologist

Phone: (580)548-5251

Matthew Callaway, Northern Region Landman

Phone: (580)249-4558

OSOWells@contres.com

Please call 24 hours in advance of performing the following operation:

- 1) Spud
- 2) Logging
- 3) DST or other formation test

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Partner Well Information Requiriements

STEVEN H. HARRIS FAMILY LIMITED PARTNERSHIP

P.O. Box 5, Bismarck, ND 58502

Attn: Terry L. Harris, Agent

Phone: (701)223-4866, Fax: (701)223-2556

tlharris123@gmail.com

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CHEYENNE PETROLEUM COMPANY LIMITED PARTNERSHIP

1400 Quail Springs Parkway, Suite 2000

Oklahoma City, OK 73134

Phone: (405)936-6220

Attn: Bill Spurgeon, Cell: (405)613-4553,

wespurgeon@cheypet.com

reports@cheypet.com

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LSM ENERGY, INC.

P O Box 523, Mandan, ND 58554

Phone: (701)527-3745

Attn: Luke Monteith

L_MONTEITH@HOTMAIL.COM

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Paris Land Company, LLC

P O Box 597

Bismarck, ND 58502

Phone: (701)255-1428

paris.codyoil@miconetwork.com

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Sandra Levorsen

412 Aspen Avenue

Bismarck, ND 58502

Phone: (713)255-1428

sandy.codyoil@midconetwork.com

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Randy Kleinjan

P O Box 523

Bismarck, ND 58504

Phone: (713)255-1428

randy.codyoil@midconetwork.com

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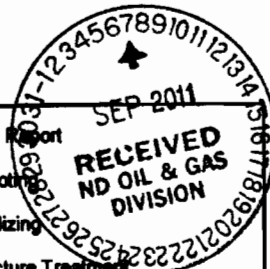
**SUNDRY NOTICES AND REPORTS ON WELLS - FORM 4**

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

Well File No.

20749

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



☒ Notice of Intent	Approximate Start Date September 19, 2011
☐ Report of Work Done	Date Work Completed
☐ Notice of Intent to Begin a Workover Project that may Qualify for a Tax Exemption Pursuant to NDCC Section 57-51.1-03.	Approximate Start Date

☐ Drilling Prognosis	☐ Spill Report
☐ Redrilling or Repair	☐ Shooting
☐ Casing or Liner	☐ Acidizing
☐ Plug Well	☐ Fracture Treatment
☐ Supplemental History	☐ Change Production Method
☐ Temporarily Abandon	☒ Reclamation
☐ Other	

Well Name and Number Marlene Steffan 1-5-8H-141-97					
Footages	Qtr-Qtr	Section	Township	Range	
310 F N L 1420 F W L	SWSE	32	142 N	97 W	
Field St Anthony	Pool Bakken	County Dunn			

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

Name of Contractor(s) FIInt			
Address 2100 20th Avenue SE	City Minot	State ND	Zip Code 58702

DETAILS OF WORK

OXY USA Inc. proposes to close the pit at the Marlene Steffan 1-5-8H-141-97 wellsite on or about 9/19/11 and will be reclaimed as follows:

- 1] Pump liquids from pit to the extent practicable. The liquids will be hauled to a permitted disposal well.
- 2] Stabilize solids remaining in the pit by mixing with flyash
- 3] Pull pit liner sides into middle of pit to cover stabilized materials
- 4] Backfill with a minimum of four feet of clean soil. The fill dirt will be mounded over the pit area and will be monitored for settling. Final contouring will take place when it is evident that there is no settling. If necessary the surface will be sloped to promote drainage away from the reclaimed area.

Company OXY USA Inc		Telephone Number 713-350-4917	
Address 5 Greenway Plaza, Suite 110			
City Houston		State Texas	Zip Code 77046
Signature 	Printed Name Terry Ryland		
Title Senior Environmental Advisor	Date 9-6-11		
Email Address terry_ryland@oxy.com			

FOR STATE USE ONLY

☐ Received	☒ Approved
Date 9-7-11	
By 	
Title Redt's	



OXY	July 29, 2011
Company	Date
Precision 426	Dunn, ND
Rig	County/State
Marlene Steffen 1-5-8H-141-97	
Survey Depths	170 to 2215 ft
Type of Survey	Measurements While Drilling (MWD)
Survey Depths	ft
Type of Survey	
Survey Depths	to ft
Type of Survey	
Site Supervisor	Jeromy Haggerty


Jing Jing Huang
DEC Engineer

Marlene Steffen 1-5-8H-141-97 MWD 0' to 2215' Survey Report

(Def Survey)



Report Date: July 29, 2011 - 02:03 AM
Client: OXY
Field: ND, Dunn County (NAD 83 SZ) 2011
Structure / Slot: Oxy (Marlene Steffen 1-5-8H-141-97) - Precision 426
Well: Marlene Steffen 1-5-8H-141-97
Borehole: Original Hole
UWI / APW: Unknown / Unknown
Survey Name: Marlene Steffen 1-5-8H-141-97 MWD 0' to 2215'
Survey Date: July 28, 2011
Tort / AHD / DDI / ERD Ratio: 6.233 / 22.238 ft / 2.142 / 0.010
Coordinate Reference System: NAD83 North Dakota State Plane, Southern Zone, US Feet
Location Lat / Long: N 48° 4' 6.15000", W 102° 59' 45.63996"
Location Grid N/E Y/X: N 885666.586 NUS, E 1358200.882 IUS
CRS Grid Convergence Angle: -1.82054707 °
Grid Scale Factor: 1.0001688

Survey / DLS Computation: Minimum Curvature / Lubinski
Vertical Section Azimuth: 179.980 ° (True North)
Vertical Section Origin: 0.000 ft, 0.000 ft
TVD Reference Datum: RKB
TVD Reference Elevation: 2650.900 ft above Unknown
Seabed / Ground Elevation: 2618.000 ft above Unknown
Magnetic Declination: 8.266 °
Total Field Strength: 56722.234 nT
Magnetic Dip Angle: 73.178 °
Declination Date: July 29, 2011
Magnetic Declination Model: BGM 2011
North Reference: True North
Grid Convergence Used: 0.000 °
Total Corr Mag North-True North: 8.266 °
Local Coord Referenced To: Well Head

Comments	MD (ft)	Incl (°)	Azin True (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (ft100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
Surface	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	885666.59	1358200.88	N 48 4 6.15	W 102 59 45.84
Begin MWD Survey	170.00	0.26	199.78	170.00	0.36	-0.36	-0.13	0.15	885666.23	1358200.74	N 48 4 6.15	W 102 59 45.64
	201.00	0.26	210.15	201.00	0.49	-0.49	-0.19	0.15	885666.10	1358200.68	N 48 4 6.15	W 102 59 45.64
	260.00	0.26	224.65	260.00	0.70	-0.70	-0.35	0.11	885665.90	1358200.51	N 48 4 6.14	W 102 59 45.65
	320.00	0.44	218.28	320.00	0.98	-0.98	-0.59	0.31	885665.63	1358200.26	N 48 4 6.14	W 102 59 45.65
	410.00	0.44	214.37	409.99	1.53	-1.54	-1.00	0.03	885665.08	1358199.84	N 48 4 6.13	W 102 59 45.65
	501.00	0.44	212.88	500.99	2.12	-2.12	-1.39	0.01	885664.51	1358199.43	N 48 4 6.13	W 102 59 45.66
	581.00	0.53	219.69	580.99	2.73	-2.73	-1.84	0.12	885663.92	1358198.96	N 48 4 6.12	W 102 59 45.67
	679.00	0.53	263.15	678.99	3.09	-3.09	-2.50	0.45	885663.58	1358198.28	N 48 4 6.12	W 102 59 45.68
	757.00	0.62	279.45	758.98	3.06	-3.06	-3.28	0.24	885663.63	1358197.51	N 48 4 6.12	W 102 59 45.69
	872.00	0.70	276.88	871.97	2.88	-2.88	-4.59	0.07	885663.85	1358198.20	N 48 4 6.12	W 102 59 45.71
	951.00	0.62	273.34	950.97	2.79	-2.80	-5.49	0.11	885663.96	1358195.30	N 48 4 6.12	W 102 59 45.72
	1041.00	0.88	273.56	1040.96	2.72	-2.73	-6.67	0.29	885664.07	1358194.13	N 48 4 6.12	W 102 59 45.74
	1131.00	0.44	294.97	1130.95	2.53	-2.54	-7.67	0.55	885664.29	1358193.13	N 48 4 6.12	W 102 59 45.75
	1221.00	0.79	292.86	1220.95	2.15	-2.15	-8.56	0.39	885664.71	1358192.26	N 48 4 6.13	W 102 59 45.77
	1315.00	0.97	304.37	1314.94	1.44	-1.45	-9.81	0.27	885665.45	1358191.03	N 48 4 6.14	W 102 59 45.78
	1408.00	1.14	305.07	1407.92	0.47	-0.47	-11.22	0.18	885666.47	1358189.85	N 48 4 6.15	W 102 59 45.81
	1502.00	0.79	291.85	1501.91	-0.31	0.30	-12.58	0.44	885667.29	1358188.31	N 48 4 6.15	W 102 59 45.83
	1597.00	0.70	342.47	1596.90	-1.11	1.10	-13.37	0.68	885668.11	1358187.55	N 48 4 6.16	W 102 59 45.84
	1689.00	0.79	358.47	1688.89	-2.28	2.27	-13.56	0.25	885669.29	1358187.40	N 48 4 6.17	W 102 59 45.84
	1784.00	0.70	17.98	1783.89	-3.49	3.48	-13.39	0.28	885670.49	1358187.60	N 48 4 6.18	W 102 59 45.84
	1875.00	0.79	30.15	1874.88	-4.56	4.55	-12.91	0.20	885671.54	1358188.12	N 48 4 6.19	W 102 59 45.83
	1970.00	0.53	57.97	1969.87	-5.36	5.35	-12.21	0.43	885672.32	1358188.85	N 48 4 6.20	W 102 59 45.82
	2064.00	0.18	84.87	2063.87	-5.65	5.64	-11.70	0.37	885672.60	1358189.36	N 48 4 6.21	W 102 59 45.81
	2158.00	0.44	192.18	2157.87	-5.36	5.35	-11.65	0.60	885672.31	1358189.41	N 48 4 6.20	W 102 59 45.81
Last MWD Survey	2215.00	0.53	212.35	2214.87	-4.92	4.91	-11.83	0.34	885671.88	1358189.21	N 48 4 6.20	W 102 59 45.81

Survey Type: Def Survey

Survey Error Model: ISCWSA Rev 0 *** 3-D 95.000% Confidence 2.7955 sigma

Description	MD From (ft)	MD To (ft)	EDU Freq (ft)	Survey Tool Type	Borehole / Survey
	0.000	32.900	Act Sins	SLB_MWD-STD-Depth Only	Original Hole / Marlene Steffen 1-5-8H-141-97 MWD 0' to 2215'
	32.900	2215.000	Act Sins	SLB_MWD-STD	Original Hole / Marlene Steffen 1-5-8H-141-97 MWD 0' to 2215'

**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.

20749

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

☐ Notice of Intent	Approximate Start Date
☐ Report of Work Done	Date Work Completed
☐ 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 | Move well bore |

Well Name and Number Marlene Steffan 1-5-8H-141-97							
Footages		Qtr-Qtr	Section	Township	Range		
310 F S L 1420 F WL		SESE	32	142 N	97 W		
Field		Pool	County				
St. Anthony		Three Forks	Dunn				

24-HOUR PRODUCTION RATE

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

Name of Contractor(s) Precision 426			
Address	City	State	Zip Code

DETAILS OF WORK

Following construction of the location it was necessary to move the well bore 40' south of the original stake to accommodate a different rig.

Attached are new surveys and a new directional plan.

There is no change to the kick off depth or the bottom hole location.

Company OXY USA Inc.		Telephone Number (713) 366-5303	
Address PO Box 27757			
City Houston		State TX	Zip Code 77227-7757
Signature 		Printed Name Elizabeth S. Bush-Ivie	
Title Sr. Regulatory Advisor		Date 7/8/11	
Email Address Elizabeth_Bush@oxy.com			

FOR STATE USE ONLY

☐ Received	☒ Approved
Date 7-11-11	
By 	
Title Petroleum Resource Specialist	

Erbele, Nathaniel H.

From: Elizabeth_Bush@oxy.com

Sent: Monday, July 11, 2011 2:50 PM

To: Erbele, Nathaniel H.

Subject: RE: Location change sundry for Marlene Steffan 1-5-8H-141-97

There is no occupied building within 500' and no one within 1320' of the new well bore location.

Thanks for the heads up on the required verification for future filing.s

Thanks,

Liz Bush-Ivie

Elizabeth S. Bush-Ivie, P.E.

Sr. Regulatory Advisor

Williston Business Unit

OXY USA Inc.

PH 713-366-5303

Cell 832-474-3701

Fax 713-985-1479

From: Erbele, Nathaniel H. [mailto:nherbele@nd.gov]

Sent: Monday, July 11, 2011 1:14 PM

To: Bush, Elizabeth S.

Subject: Location change sundry for Marlene Steffan 1-5-8H-141-97

Liz,

Could you please provide an email statement verifying that the new location is not within 500' of an occupied dwelling and that anyone within 1320' has been notified?

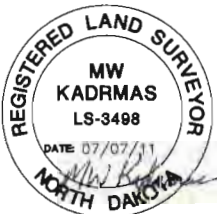
This statement is required on all surface location changes and should be included on the sundry notice for future changes.

Thanks,

Nathaniel Erbele
NDIC Oil and Gas Division
(701) 328-8020

7/11/2011

WELLS SERVICE, INC.
OXY USA INC.
P.O. BOX 2000, DICKINSON, ND 58601
MARLENE STEFFAN 1-5-8H-141-97
310 FEET FROM SOUTH LINE AND 1420 FEET FROM EAST LINE
SEC 32, T142N, R97W, 5TH P.M.
DUNN COUNTY, NORTH DAKOTA



STAKED ON 02/17/11
VERTICAL CONTROL DATUM WAS BASED UPON
CONTROL POINT 2 WITH AN ELEVATION OF 2686.88'

THIS SURVEY AND PLAT IS BEING PROVIDED AT THE REQUEST OF
PAM KALSTROM OF ANSCHUTZ EXPLORATION COMPANY.
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
INTERSTATE ENGINEERING INC.
P.O. BOX 266
110 2ND AVENUE SW
BELFIELD, NORTH DAKOTA 58622

A topographic map of the study area. The map shows contour lines with elevations of 100, 150, 200, 250, 300, 350, 400, 450, 500, 550, 600, 650, 700, 750, 800, 850, 900, 950, 1000, 1050, 1100, 1150, 1200, 1250, 1300, 1350, 1400, 1450, 1500, 1550, 1600, 1650, 1700, 1750, 1800, 1850, 1900, 1950, 2000, 2050, 2100, 2150, 2200, 2250, 2300, 2350, 2400, 2450, 2500, 2550, 2600, 2650, 2700, 2750, 2800, 2850, 2900, 2950, 3000, 3050, 3100, 3150, 3200, 3250, 3300, 3350, 3400, 3450, 3500, 3550, 3600, 3650, 3700, 3750, 3800, 3850, 3900, 3950, 4000, 4050, 4100, 4150, 4200, 4250, 4300, 4350, 4400, 4450, 4500, 4550, 4600, 4650, 4700, 4750, 4800, 4850, 4900, 4950, 5000, 5050, 5100, 5150, 5200, 5250, 5300, 5350, 5400, 5450, 5500, 5550, 5600, 5650, 5700, 5750, 5800, 5850, 5900, 5950, 6000, 6050, 6100, 6150, 6200, 6250, 6300, 6350, 6400, 6450, 6500, 6550, 6600, 6650, 6700, 6750, 6800, 6850, 6900, 6950, 7000, 7050, 7100, 7150, 7200, 7250, 7300, 7350, 7400, 7450, 7500, 7550, 7600, 7650, 7700, 7750, 7800, 7850, 7900, 7950, 8000, 8050, 8100, 8150, 8200, 8250, 8300, 8350, 8400, 8450, 8500, 8550, 8600, 8650, 8700, 8750, 8800, 8850, 8900, 8950, 9000, 9050, 9100, 9150, 9200, 9250, 9300, 9350, 9400, 9450, 9500, 9550, 9600, 9650, 9700, 9750, 9800, 9850, 9900, 9950, 10000. A north arrow is located in the upper left corner. A scale bar is located in the upper right corner. The well location is marked with a black dot and labeled 'WELL LOCATION'.

SHEET
1 of 6



interstate engineering, inc.
Engineering - Surveying - Planning
P.O. Box 266 Belfield, North Dakota (701)-575-2247 Fax(701)-575-2251

MARLENE STEFFAN 1-5-8H-141-97
FINISH GRADE ELEV. 2618.0'
LATITUDE 47°04'05.76"N
LONGITUDE 102°59'45.64"W
GPS SURVEY DATUM: WGS84

[illegible]

OXY USA INC. WELL LOCATION SEC 32, T142N, R97W, 5TH P.M. DUNN COUNTY, NORTH DAKOTA	
Drawn By J.J.W. Checked By M.W.K.	Project No. B11-08-012.01 Date JULY 2011

Revision No.	Date	By	Description
1	4/25/10	J.W.	WELL MOVE



Weatherford[®]

Drilling Services



PROPOSAL

OXY USA

MARLENE STEFFAN 1-5-8H-141-97

DUNN COUNTY, ND

PLAN 2

JULY 8, 2011

Weatherford International Ltd.

410 17th Street, Suite 400

Denver, Colorado 80202

+1.303.825.6558 Main

+1.303.825.2927 Fax

www.weatherford.com



Project: DUNN COUNTY, ND
Site: MARLENE STEFFAN 1-5-8H-141-97
Well: MARLENE STEFFAN 1-5-8H-141-97
Wellbore: MARLENE STEFFAN 1-5-8H-141-97
Design: Design #2
Latitude: 47° 4' 5.760 N
Longitude: 102° 59' 45.640 W
GL: 2620.00
KB: WELL @ 2650.90ft (PRECISION 426)



WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape
PBHL MARLENE STEFFAN 1-5-8H-141-97	10789.00	-10658.24	8.28	47° 2' 20.556 N	102° 59' 45.521 W	Point

WELL DETAILS: MARLENE STEFFAN 1-5-8H-141-97

+N/-S	+E/-W	Northings	Easting	Ground Level: 2620.00	Latitude	Longitude	Slot
0.00	0.00	521030.64	1346610.84		47° 4' 5.760 N	102° 59' 45.640 W	

SECTION DETAILS

MD	Inc	Azi	TVD	+N/-S	+E/-W	DLeg	TFace	VSec	Annotation
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
10216.04	0.00	0.00	10216.04	0.00	0.00	0.00	0.00	0.00	Start Build 10.00
11116.04	90.00	179.96	10789.00	-572.96	0.44	10.00	179.96	572.96	Start 10085.28 hold at 11116.04 MD
21201.33	90.00	179.96	10789.00	-10658.24	8.28	0.00	0.00	10658.24	TD at 21201.33



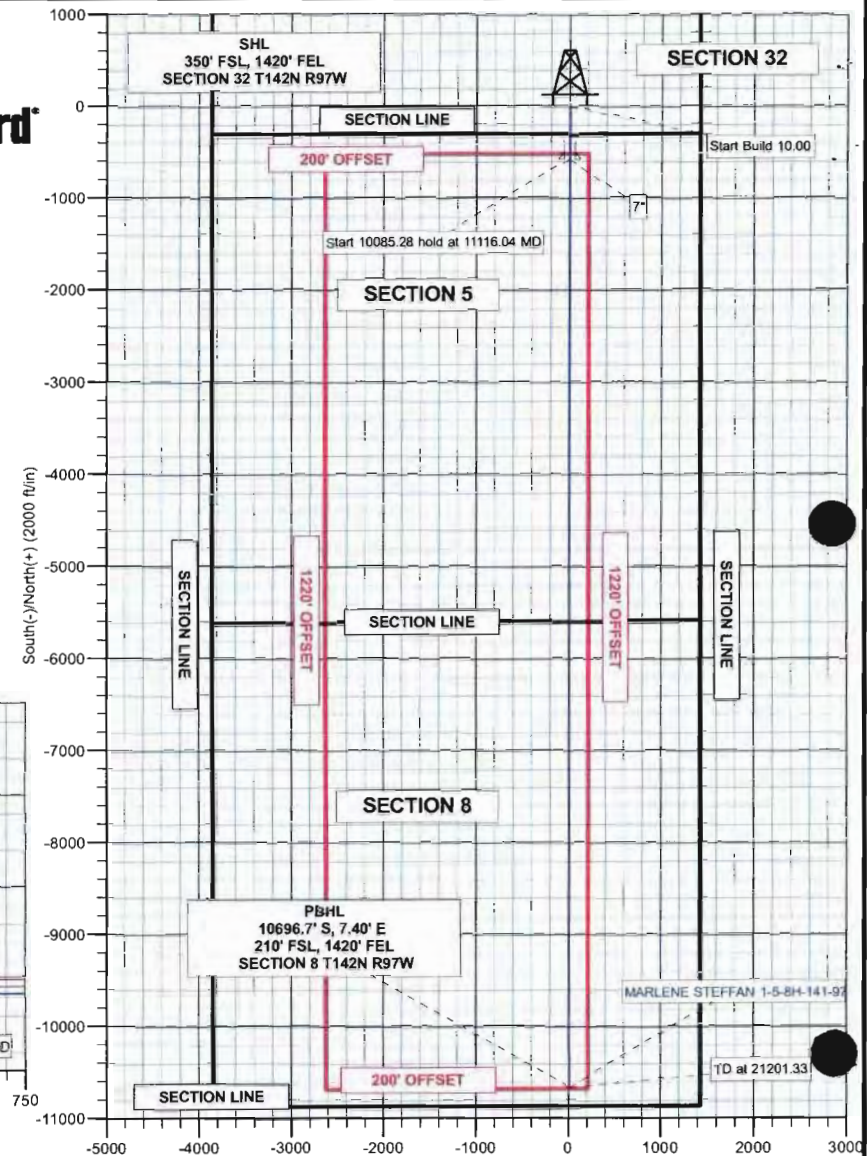
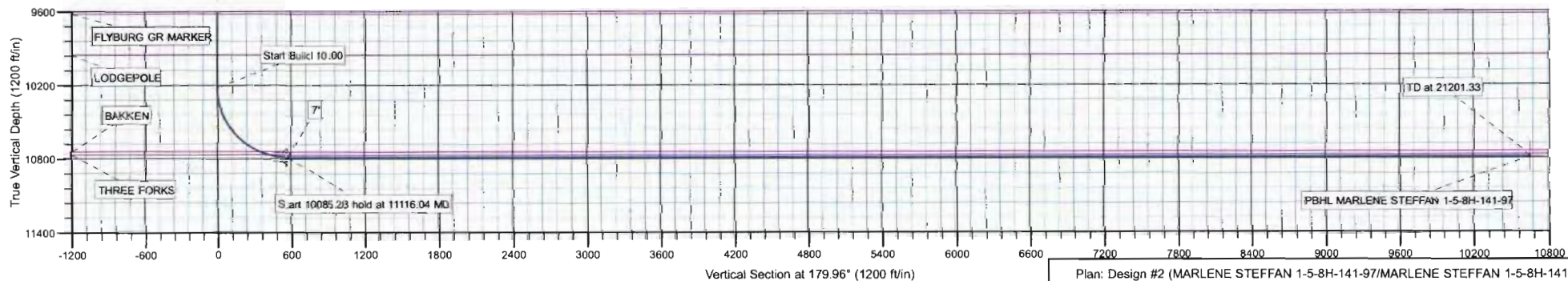
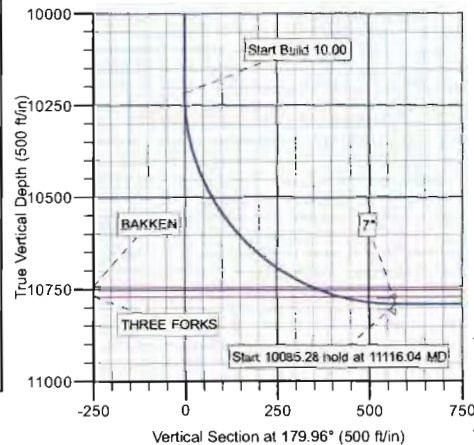
Azimuths to True North
Magnetic North: 8.27°
Magnetic Field
Strength: 56343.5nT
Dip Angle: 72.47°
Date: 7/8/2011
Model: BGGM2010

PROJECT DETAILS: DUNN COUNTY, ND

Geodetic System: US State Plane 1983
Datum: North American Datum 1983
Ellipsoid: GRS 1980
Zone: North Dakota Southern Zone
System Datum: Mean Sea Level

FORMATION TOP DETAILS

TVDPath	MDPath	Formation
2153.00	2153.00	PIERRE SHALE
4328.00	4328.00	MINNEKAHTA
4789.00	4789.00	GREENHORN
5251.00	5251.00	MOWRY
5630.00	5630.00	DAKOTA
6504.00	6504.00	RIERDON
6896.00	6896.00	DUNHAM SALT
6966.00	6966.00	SPEARFISH
7383.00	7383.00	OPECHE SALT
7756.00	7756.00	MINNELUSA
8279.00	8279.00	TYLER
8747.00	8747.00	KIBBY LIMESTONE
8875.00	8875.00	MADISON
8902.00	8902.00	FIRST CHARLES SALT
9179.00	9179.00	GREENPOINT ANHYDRITE
9283.00	9283.00	BASE LAST SALT
9452.00	9452.00	MISSION CANYON
9621.00	9621.00	FLYBURG GR MARKER
9953.00	9953.00	LODGEPOLE
10743.00	10884.89	BAKKEN
10769.00	10964.21	THREE FORKS



Plan: Design #2 (MARLENE STEFFAN 1-5-8H-141-97/MARLENE STEFFAN 1-5-8H-141-97)

Created By: TRACY WILLIAMS Date: 9:27, July 08 2011



OXY USA

DUNN COUNTY, ND

MARLENE STEFFAN 1-5-8H-141-97

MARLENE STEFFAN 1-5-8H-141-97

MARLENE STEFFAN 1-5-8H-141-97

Plan: Design #2

Standard Planning Report

08 July, 2011



Weatherford®



Weatherford International Ltd.

Planning Report



Database:	EDM 2003.21 Single User Db	Local Co-ordinate Reference:	Site MARLENE STEFFAN 1-5-8H-141-97
Company:	OXY USA	TVD Reference:	WELL @ 2650.90ft (PRECISION 426)
Project:	DUNN COUNTY, ND	MD Reference:	WELL @ 2650.90ft (PRECISION 426)
Site:	MARLENE STEFFAN 1-5-8H-141-97	North Reference:	True
Well:	MARLENE STEFFAN 1-5-8H-141-97	Survey Calculation Method:	Minimum Curvature
Wellbore:	MARLENE STEFFAN 1-5-8H-141-97		
Design:	Design #2		

Project	DUNN COUNTY, ND		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	North Dakota Southern Zone		

Site		MARLENE STEFFAN 1-5-8H-141-97			
Site Position:		Northing:	521,030.64 ft	Latitude:	47° 4' 5.760 N
From:	Lat/Long	Easting:	1,346,610.84 ft	Longitude:	102° 59' 45.640 W
Position Uncertainty:	0.00 ft	Slot Radius:	"	Grid Convergence:	-1.82 °

Well	MARLENE STEFFAN 1-5-8H-141-97					
Well Position	+N/-S	0.00 ft	Northing:	521,030.64 ft	Latitude:	47° 4' 5.760 N
	+E/-W	0.00 ft	Easting:	1,346,610.84 ft	Longitude:	102° 59' 45.640 W
Position Uncertainty	0.00 ft	Wellhead Elevation:	ft	Ground Level:	2,620.00 ft	

Wellbore	MARLENE STEFFAN 1-5-8H-141-97				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	BGGM2010	7/8/2011	8.27	72.47	56,343

Design	Design #2			
Audit Notes:				
Version:	Phase:	PROTOTYPE	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.00	0.00	0.00	179.96

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
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
10,216.04	0.00	0.00	10,216.04	0.00	0.00	0.00	0.00	0.00	0.00	
11,116.04	90.00	179.96	10,789.00	-572.96	0.44	10.00	10.00	0.00	179.96	
21,201.33	90.00	179.96	10,789.00	-10,658.24	8.28	0.00	0.00	0.00	0.00	PBHL MARLENE S



Database:	EDM 2003.21 Single User Db	Local Co-ordinate Reference:	Site MARLENE STEFFAN 1-5-8H-141-97
Company:	OXY USA	TVD Reference:	WELL @ 2650.90ft (PRECISION 426)
Project:	DUNN COUNTY, ND	MD Reference:	WELL @ 2650.90ft (PRECISION 426)
Site:	MARLENE STEFFAN 1-5-8H-141-97	North Reference:	True
Well:	MARLENE STEFFAN 1-5-8H-141-97	Survey Calculation Method:	Minimum Curvature
Wellbore:	MARLENE STEFFAN 1-5-8H-141-97		
Design:	Design #2		

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)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	0.00	0.00
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	0.00	0.00
1,000.00	0.00	0.00	1,000.00	0.00	0.00	0.00	0.00	0.00	0.00
1,100.00	0.00	0.00	1,100.00	0.00	0.00	0.00	0.00	0.00	0.00
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00
1,300.00	0.00	0.00	1,300.00	0.00	0.00	0.00	0.00	0.00	0.00
1,400.00	0.00	0.00	1,400.00	0.00	0.00	0.00	0.00	0.00	0.00
1,500.00	0.00	0.00	1,500.00	0.00	0.00	0.00	0.00	0.00	0.00
1,600.00	0.00	0.00	1,600.00	0.00	0.00	0.00	0.00	0.00	0.00
1,700.00	0.00	0.00	1,700.00	0.00	0.00	0.00	0.00	0.00	0.00
1,800.00	0.00	0.00	1,800.00	0.00	0.00	0.00	0.00	0.00	0.00
1,900.00	0.00	0.00	1,900.00	0.00	0.00	0.00	0.00	0.00	0.00
2,000.00	0.00	0.00	2,000.00	0.00	0.00	0.00	0.00	0.00	0.00
2,100.00	0.00	0.00	2,100.00	0.00	0.00	0.00	0.00	0.00	0.00
2,200.00	0.00	0.00	2,200.00	0.00	0.00	0.00	0.00	0.00	0.00
2,300.00	0.00	0.00	2,300.00	0.00	0.00	0.00	0.00	0.00	0.00
2,400.00	0.00	0.00	2,400.00	0.00	0.00	0.00	0.00	0.00	0.00
2,500.00	0.00	0.00	2,500.00	0.00	0.00	0.00	0.00	0.00	0.00
2,600.00	0.00	0.00	2,600.00	0.00	0.00	0.00	0.00	0.00	0.00
2,700.00	0.00	0.00	2,700.00	0.00	0.00	0.00	0.00	0.00	0.00
2,800.00	0.00	0.00	2,800.00	0.00	0.00	0.00	0.00	0.00	0.00
2,900.00	0.00	0.00	2,900.00	0.00	0.00	0.00	0.00	0.00	0.00
3,000.00	0.00	0.00	3,000.00	0.00	0.00	0.00	0.00	0.00	0.00
3,100.00	0.00	0.00	3,100.00	0.00	0.00	0.00	0.00	0.00	0.00
3,200.00	0.00	0.00	3,200.00	0.00	0.00	0.00	0.00	0.00	0.00
3,300.00	0.00	0.00	3,300.00	0.00	0.00	0.00	0.00	0.00	0.00
3,400.00	0.00	0.00	3,400.00	0.00	0.00	0.00	0.00	0.00	0.00
3,500.00	0.00	0.00	3,500.00	0.00	0.00	0.00	0.00	0.00	0.00
3,600.00	0.00	0.00	3,600.00	0.00	0.00	0.00	0.00	0.00	0.00
3,700.00	0.00	0.00	3,700.00	0.00	0.00	0.00	0.00	0.00	0.00
3,800.00	0.00	0.00	3,800.00	0.00	0.00	0.00	0.00	0.00	0.00
3,900.00	0.00	0.00	3,900.00	0.00	0.00	0.00	0.00	0.00	0.00
4,000.00	0.00	0.00	4,000.00	0.00	0.00	0.00	0.00	0.00	0.00
4,100.00	0.00	0.00	4,100.00	0.00	0.00	0.00	0.00	0.00	0.00
4,200.00	0.00	0.00	4,200.00	0.00	0.00	0.00	0.00	0.00	0.00
4,300.00	0.00	0.00	4,300.00	0.00	0.00	0.00	0.00	0.00	0.00
4,400.00	0.00	0.00	4,400.00	0.00	0.00	0.00	0.00	0.00	0.00
4,500.00	0.00	0.00	4,500.00	0.00	0.00	0.00	0.00	0.00	0.00
4,600.00	0.00	0.00	4,600.00	0.00	0.00	0.00	0.00	0.00	0.00
4,700.00	0.00	0.00	4,700.00	0.00	0.00	0.00	0.00	0.00	0.00
4,800.00	0.00	0.00	4,800.00	0.00	0.00	0.00	0.00	0.00	0.00
4,900.00	0.00	0.00	4,900.00	0.00	0.00	0.00	0.00	0.00	0.00
5,000.00	0.00	0.00	5,000.00	0.00	0.00	0.00	0.00	0.00	0.00
5,100.00	0.00	0.00	5,100.00	0.00	0.00	0.00	0.00	0.00	0.00
5,200.00	0.00	0.00	5,200.00	0.00	0.00	0.00	0.00	0.00	0.00
5,300.00	0.00	0.00	5,300.00	0.00	0.00	0.00	0.00	0.00	0.00



Database:	EDM 2003.21 Single User Db	Local Co-ordinate Reference:	Site MARLENE STEFFAN 1-5-8H-141-97
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Wellbore:	MARLENE STEFFAN 1-5-8H-141-97		
Design:	Design #2		

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)
5,400.00	0.00	0.00	5,400.00	0.00	0.00	0.00	0.00	0.00	0.00
5,500.00	0.00	0.00	5,500.00	0.00	0.00	0.00	0.00	0.00	0.00
5,600.00	0.00	0.00	5,600.00	0.00	0.00	0.00	0.00	0.00	0.00
5,700.00	0.00	0.00	5,700.00	0.00	0.00	0.00	0.00	0.00	0.00
5,800.00	0.00	0.00	5,800.00	0.00	0.00	0.00	0.00	0.00	0.00
5,900.00	0.00	0.00	5,900.00	0.00	0.00	0.00	0.00	0.00	0.00
6,000.00	0.00	0.00	6,000.00	0.00	0.00	0.00	0.00	0.00	0.00
6,100.00	0.00	0.00	6,100.00	0.00	0.00	0.00	0.00	0.00	0.00
6,200.00	0.00	0.00	6,200.00	0.00	0.00	0.00	0.00	0.00	0.00
6,300.00	0.00	0.00	6,300.00	0.00	0.00	0.00	0.00	0.00	0.00
6,400.00	0.00	0.00	6,400.00	0.00	0.00	0.00	0.00	0.00	0.00
6,500.00	0.00	0.00	6,500.00	0.00	0.00	0.00	0.00	0.00	0.00
6,600.00	0.00	0.00	6,600.00	0.00	0.00	0.00	0.00	0.00	0.00
6,700.00	0.00	0.00	6,700.00	0.00	0.00	0.00	0.00	0.00	0.00
6,800.00	0.00	0.00	6,800.00	0.00	0.00	0.00	0.00	0.00	0.00
6,900.00	0.00	0.00	6,900.00	0.00	0.00	0.00	0.00	0.00	0.00
7,000.00	0.00	0.00	7,000.00	0.00	0.00	0.00	0.00	0.00	0.00
7,100.00	0.00	0.00	7,100.00	0.00	0.00	0.00	0.00	0.00	0.00
7,200.00	0.00	0.00	7,200.00	0.00	0.00	0.00	0.00	0.00	0.00
7,300.00	0.00	0.00	7,300.00	0.00	0.00	0.00	0.00	0.00	0.00
7,400.00	0.00	0.00	7,400.00	0.00	0.00	0.00	0.00	0.00	0.00
7,500.00	0.00	0.00	7,500.00	0.00	0.00	0.00	0.00	0.00	0.00
7,600.00	0.00	0.00	7,600.00	0.00	0.00	0.00	0.00	0.00	0.00
7,700.00	0.00	0.00	7,700.00	0.00	0.00	0.00	0.00	0.00	0.00
7,800.00	0.00	0.00	7,800.00	0.00	0.00	0.00	0.00	0.00	0.00
7,900.00	0.00	0.00	7,900.00	0.00	0.00	0.00	0.00	0.00	0.00
8,000.00	0.00	0.00	8,000.00	0.00	0.00	0.00	0.00	0.00	0.00
8,100.00	0.00	0.00	8,100.00	0.00	0.00	0.00	0.00	0.00	0.00
8,200.00	0.00	0.00	8,200.00	0.00	0.00	0.00	0.00	0.00	0.00
8,300.00	0.00	0.00	8,300.00	0.00	0.00	0.00	0.00	0.00	0.00
8,400.00	0.00	0.00	8,400.00	0.00	0.00	0.00	0.00	0.00	0.00
8,500.00	0.00	0.00	8,500.00	0.00	0.00	0.00	0.00	0.00	0.00
8,600.00	0.00	0.00	8,600.00	0.00	0.00	0.00	0.00	0.00	0.00
8,700.00	0.00	0.00	8,700.00	0.00	0.00	0.00	0.00	0.00	0.00
8,800.00	0.00	0.00	8,800.00	0.00	0.00	0.00	0.00	0.00	0.00
8,900.00	0.00	0.00	8,900.00	0.00	0.00	0.00	0.00	0.00	0.00
9,000.00	0.00	0.00	9,000.00	0.00	0.00	0.00	0.00	0.00	0.00
9,100.00	0.00	0.00	9,100.00	0.00	0.00	0.00	0.00	0.00	0.00
9,200.00	0.00	0.00	9,200.00	0.00	0.00	0.00	0.00	0.00	0.00
9,300.00	0.00	0.00	9,300.00	0.00	0.00	0.00	0.00	0.00	0.00
9,400.00	0.00	0.00	9,400.00	0.00	0.00	0.00	0.00	0.00	0.00
9,500.00	0.00	0.00	9,500.00	0.00	0.00	0.00	0.00	0.00	0.00
9,600.00	0.00	0.00	9,600.00	0.00	0.00	0.00	0.00	0.00	0.00
9,700.00	0.00	0.00	9,700.00	0.00	0.00	0.00	0.00	0.00	0.00
9,800.00	0.00	0.00	9,800.00	0.00	0.00	0.00	0.00	0.00	0.00
9,900.00	0.00	0.00	9,900.00	0.00	0.00	0.00	0.00	0.00	0.00
10,000.00	0.00	0.00	10,000.00	0.00	0.00	0.00	0.00	0.00	0.00
10,100.00	0.00	0.00	10,100.00	0.00	0.00	0.00	0.00	0.00	0.00
10,200.00	0.00	0.00	10,200.00	0.00	0.00	0.00	0.00	0.00	0.00
Start Build 10.00									
10,216.04	0.00	0.00	10,216.04	0.00	0.00	0.00	0.00	0.00	0.00
10,250.00	3.40	179.96	10,249.98	-1.01	0.00	1.01	10.00	10.00	0.00
10,300.00	8.40	179.96	10,299.70	-6.14	0.00	6.14	10.00	10.00	0.00



Database: EDM 2003.21 Single User Db
 Company: OXY USA
 Project: DUNN COUNTY, ND
 Site: MARLENE STEFFAN 1-5-8H-141-97
 Well: MARLENE STEFFAN 1-5-8H-141-97
 Wellbore: MARLENE STEFFAN 1-5-8H-141-97
 Design: Design #2

Local Co-ordinate Reference: Site MARLENE STEFFAN 1-5-8H-141-97
 TVD Reference: WELL @ 2650.90ft (PRECISION 426)
 MD Reference: WELL @ 2650.90ft (PRECISION 426)
 North Reference: True
 Survey Calculation Method: Minimum Curvature

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)
10,350.00	13.40	179.96	10,348.78	-15.59	0.01	15.59	10.00	10.00	0.00
10,400.00	18.40	179.96	10,396.86	-29.28	0.02	29.28	10.00	10.00	0.00
10,450.00	23.40	179.96	10,443.55	-47.11	0.04	47.11	10.00	10.00	0.00
10,500.00	28.40	179.96	10,488.52	-68.94	0.05	68.94	10.00	10.00	0.00
10,550.00	33.40	179.96	10,531.41	-94.60	0.07	94.60	10.00	10.00	0.00
10,600.00	38.40	179.96	10,571.90	-123.91	0.10	123.91	10.00	10.00	0.00
10,650.00	43.40	179.96	10,609.68	-156.63	0.12	156.63	10.00	10.00	0.00
10,700.00	48.40	179.96	10,644.47	-192.52	0.15	192.53	10.00	10.00	0.00
10,750.00	53.40	179.96	10,676.00	-231.31	0.18	231.31	10.00	10.00	0.00
10,800.00	58.40	179.96	10,704.02	-272.70	0.21	272.70	10.00	10.00	0.00
10,850.00	63.40	179.96	10,728.34	-316.37	0.25	316.37	10.00	10.00	0.00
10,900.00	68.40	179.96	10,748.75	-362.00	0.28	362.00	10.00	10.00	0.00
10,950.00	73.40	179.96	10,765.11	-409.23	0.32	409.23	10.00	10.00	0.00
11,000.00	78.40	179.96	10,777.29	-457.71	0.36	457.71	10.00	10.00	0.00
11,050.00	83.40	179.96	10,785.20	-507.06	0.39	507.06	10.00	10.00	0.00
11,100.00	88.40	179.96	10,788.78	-556.92	0.43	556.92	10.00	10.00	0.00
Start 10085.28 hold at 11116.04 MD									
11,116.04	90.00	179.96	10,789.00	-572.96	0.44	572.96	10.00	10.00	0.00
11,200.00	90.00	179.96	10,789.00	-656.92	0.51	656.92	0.00	0.00	0.00
11,300.00	90.00	179.96	10,789.00	-756.92	0.59	756.92	0.00	0.00	0.00
11,400.00	90.00	179.96	10,789.00	-856.92	0.67	856.92	0.00	0.00	0.00
11,500.00	90.00	179.96	10,789.00	-956.92	0.74	956.92	0.00	0.00	0.00
11,600.00	90.00	179.96	10,789.00	-1,056.92	0.82	1,056.92	0.00	0.00	0.00
11,700.00	90.00	179.96	10,789.00	-1,156.92	0.90	1,156.92	0.00	0.00	0.00
11,800.00	90.00	179.96	10,789.00	-1,256.92	0.98	1,256.92	0.00	0.00	0.00
11,900.00	90.00	179.96	10,789.00	-1,356.92	1.05	1,356.92	0.00	0.00	0.00
12,000.00	90.00	179.96	10,789.00	-1,456.92	1.13	1,456.92	0.00	0.00	0.00
12,100.00	90.00	179.96	10,789.00	-1,556.92	1.21	1,556.92	0.00	0.00	0.00
12,200.00	90.00	179.96	10,789.00	-1,656.92	1.29	1,656.92	0.00	0.00	0.00
12,300.00	90.00	179.96	10,789.00	-1,756.92	1.36	1,756.92	0.00	0.00	0.00
12,400.00	90.00	179.96	10,789.00	-1,856.92	1.44	1,856.92	0.00	0.00	0.00
12,500.00	90.00	179.96	10,789.00	-1,956.92	1.52	1,956.92	0.00	0.00	0.00
12,600.00	90.00	179.96	10,789.00	-2,056.92	1.60	2,056.92	0.00	0.00	0.00
12,700.00	90.00	179.96	10,789.00	-2,156.92	1.67	2,156.92	0.00	0.00	0.00
12,800.00	90.00	179.96	10,789.00	-2,256.92	1.75	2,256.92	0.00	0.00	0.00
12,900.00	90.00	179.96	10,789.00	-2,356.92	1.83	2,356.92	0.00	0.00	0.00
13,000.00	90.00	179.96	10,789.00	-2,456.92	1.91	2,456.92	0.00	0.00	0.00
13,100.00	90.00	179.96	10,789.00	-2,556.92	1.99	2,556.92	0.00	0.00	0.00
13,200.00	90.00	179.96	10,789.00	-2,656.92	2.06	2,656.92	0.00	0.00	0.00
13,300.00	90.00	179.96	10,789.00	-2,756.92	2.14	2,756.92	0.00	0.00	0.00
13,400.00	90.00	179.96	10,789.00	-2,856.92	2.22	2,856.92	0.00	0.00	0.00
13,500.00	90.00	179.96	10,789.00	-2,956.92	2.30	2,956.92	0.00	0.00	0.00
13,600.00	90.00	179.96	10,789.00	-3,056.92	2.37	3,056.92	0.00	0.00	0.00
13,700.00	90.00	179.96	10,789.00	-3,156.92	2.45	3,156.92	0.00	0.00	0.00
13,800.00	90.00	179.96	10,789.00	-3,256.92	2.53	3,256.92	0.00	0.00	0.00
13,900.00	90.00	179.96	10,789.00	-3,356.92	2.61	3,356.92	0.00	0.00	0.00
14,000.00	90.00	179.96	10,789.00	-3,456.92	2.68	3,456.92	0.00	0.00	0.00
14,100.00	90.00	179.96	10,789.00	-3,556.92	2.76	3,556.92	0.00	0.00	0.00
14,200.00	90.00	179.96	10,789.00	-3,656.91	2.84	3,656.92	0.00	0.00	0.00
14,300.00	90.00	179.96	10,789.00	-3,756.91	2.92	3,756.92	0.00	0.00	0.00
14,400.00	90.00	179.96	10,789.00	-3,856.91	2.99	3,856.92	0.00	0.00	0.00
14,500.00	90.00	179.96	10,789.00	-3,956.91	3.07	3,956.92	0.00	0.00	0.00
14,600.00	90.00	179.96	10,789.00	-4,056.91	3.15	4,056.92	0.00	0.00	0.00
14,700.00	90.00	179.96	10,789.00	-4,156.91	3.23	4,156.92	0.00	0.00	0.00



Weatherford International Ltd.

Planning Report



Database:	EDM 2003.21 Single User Db	Local Co-ordinate Reference:	Site MARLENE STEFFAN 1-5-8H-141-97
Company:	OXY USA	TVD Reference:	WELL @ 2650.90ft (PRECISION 426)
Project:	DUNN COUNTY, ND	MD Reference:	WELL @ 2650.90ft (PRECISION 426)
Site:	MARLENE STEFFAN 1-5-8H-141-97	North Reference:	True
Well:	MARLENE STEFFAN 1-5-8H-141-97	Survey Calculation Method:	Minimum Curvature
Wellbore:	MARLENE STEFFAN 1-5-8H-141-97		
Design:	Design #2		

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)
14,800.00	90.00	179.96	10,789.00	-4,256.91	3.31	4,256.92	0.00	0.00	0.00
14,900.00	90.00	179.96	10,789.00	-4,356.91	3.38	4,356.92	0.00	0.00	0.00
15,000.00	90.00	179.96	10,789.00	-4,456.91	3.46	4,456.92	0.00	0.00	0.00
15,100.00	90.00	179.96	10,789.00	-4,556.91	3.54	4,556.92	0.00	0.00	0.00
15,200.00	90.00	179.96	10,789.00	-4,656.91	3.62	4,656.92	0.00	0.00	0.00
15,300.00	90.00	179.96	10,789.00	-4,756.91	3.69	4,756.92	0.00	0.00	0.00
15,400.00	90.00	179.96	10,789.00	-4,856.91	3.77	4,856.92	0.00	0.00	0.00
15,500.00	90.00	179.96	10,789.00	-4,956.91	3.85	4,956.92	0.00	0.00	0.00
15,600.00	90.00	179.96	10,789.00	-5,056.91	3.93	5,056.92	0.00	0.00	0.00
15,700.00	90.00	179.96	10,789.00	-5,156.91	4.00	5,156.92	0.00	0.00	0.00
15,800.00	90.00	179.96	10,789.00	-5,256.91	4.08	5,256.92	0.00	0.00	0.00
15,900.00	90.00	179.96	10,789.00	-5,356.91	4.16	5,356.92	0.00	0.00	0.00
16,000.00	90.00	179.96	10,789.00	-5,456.91	4.24	5,456.92	0.00	0.00	0.00
16,100.00	90.00	179.96	10,789.00	-5,556.91	4.31	5,556.92	0.00	0.00	0.00
16,200.00	90.00	179.96	10,789.00	-5,656.91	4.39	5,656.92	0.00	0.00	0.00
16,300.00	90.00	179.96	10,789.00	-5,756.91	4.47	5,756.92	0.00	0.00	0.00
16,400.00	90.00	179.96	10,789.00	-5,856.91	4.55	5,856.92	0.00	0.00	0.00
16,500.00	90.00	179.96	10,789.00	-5,956.91	4.62	5,956.92	0.00	0.00	0.00
16,600.00	90.00	179.96	10,789.00	-6,056.91	4.70	6,056.92	0.00	0.00	0.00
16,700.00	90.00	179.96	10,789.00	-6,156.91	4.78	6,156.92	0.00	0.00	0.00
16,800.00	90.00	179.96	10,789.00	-6,256.91	4.86	6,256.92	0.00	0.00	0.00
16,900.00	90.00	179.96	10,789.00	-6,356.91	4.94	6,356.92	0.00	0.00	0.00
17,000.00	90.00	179.96	10,789.00	-6,456.91	5.01	6,456.92	0.00	0.00	0.00
17,100.00	90.00	179.96	10,789.00	-6,556.91	5.09	6,556.92	0.00	0.00	0.00
17,200.00	90.00	179.96	10,789.00	-6,656.91	5.17	6,656.92	0.00	0.00	0.00
17,300.00	90.00	179.96	10,789.00	-6,756.91	5.25	6,756.92	0.00	0.00	0.00
17,400.00	90.00	179.96	10,789.00	-6,856.91	5.32	6,856.92	0.00	0.00	0.00
17,500.00	90.00	179.96	10,789.00	-6,956.91	5.40	6,956.92	0.00	0.00	0.00
17,600.00	90.00	179.96	10,789.00	-7,056.91	5.48	7,056.92	0.00	0.00	0.00
17,700.00	90.00	179.96	10,789.00	-7,156.91	5.56	7,156.92	0.00	0.00	0.00
17,800.00	90.00	179.96	10,789.00	-7,256.91	5.63	7,256.92	0.00	0.00	0.00
17,900.00	90.00	179.96	10,789.00	-7,356.91	5.71	7,356.92	0.00	0.00	0.00
18,000.00	90.00	179.96	10,789.00	-7,456.91	5.79	7,456.92	0.00	0.00	0.00
18,100.00	90.00	179.96	10,789.00	-7,556.91	5.87	7,556.92	0.00	0.00	0.00
18,200.00	90.00	179.96	10,789.00	-7,656.91	5.94	7,656.92	0.00	0.00	0.00
18,300.00	90.00	179.96	10,789.00	-7,756.91	6.02	7,756.92	0.00	0.00	0.00
18,400.00	90.00	179.96	10,789.00	-7,856.91	6.10	7,856.92	0.00	0.00	0.00
18,500.00	90.00	179.96	10,789.00	-7,956.91	6.18	7,956.92	0.00	0.00	0.00
18,600.00	90.00	179.96	10,789.00	-8,056.91	6.26	8,056.92	0.00	0.00	0.00
18,700.00	90.00	179.96	10,789.00	-8,156.91	6.33	8,156.92	0.00	0.00	0.00
18,800.00	90.00	179.96	10,789.00	-8,256.91	6.41	8,256.92	0.00	0.00	0.00
18,900.00	90.00	179.96	10,789.00	-8,356.91	6.49	8,356.92	0.00	0.00	0.00
19,000.00	90.00	179.96	10,789.00	-8,456.91	6.57	8,456.92	0.00	0.00	0.00
19,100.00	90.00	179.96	10,789.00	-8,556.91	6.64	8,556.92	0.00	0.00	0.00
19,200.00	90.00	179.96	10,789.00	-8,656.91	6.72	8,656.92	0.00	0.00	0.00
19,300.00	90.00	179.96	10,789.00	-8,756.91	6.80	8,756.92	0.00	0.00	0.00
19,400.00	90.00	179.96	10,789.00	-8,856.91	6.88	8,856.92	0.00	0.00	0.00
19,500.00	90.00	179.96	10,789.00	-8,956.91	6.95	8,956.92	0.00	0.00	0.00
19,600.00	90.00	179.96	10,789.00	-9,056.91	7.03	9,056.92	0.00	0.00	0.00
19,700.00	90.00	179.96	10,789.00	-9,156.91	7.11	9,156.92	0.00	0.00	0.00
19,800.00	90.00	179.96	10,789.00	-9,256.91	7.19	9,256.92	0.00	0.00	0.00
19,900.00	90.00	179.96	10,789.00	-9,356.91	7.26	9,356.92	0.00	0.00	0.00
20,000.00	90.00	179.96	10,789.00	-9,456.91	7.34	9,456.92	0.00	0.00	0.00
20,100.00	90.00	179.96	10,789.00	-9,556.91	7.42	9,556.92	0.00	0.00	0.00



Weatherford International Ltd.

Planning Report



Weatherford

Database: EDM 2003.21 Single User Db
Company: OXY USA
Project: DUNN COUNTY, ND
Site: MARLENE STEFFAN 1-5-8H-141-97
Well: MARLENE STEFFAN 1-5-8H-141-97
Wellbore: MARLENE STEFFAN 1-5-8H-141-97
Design: Design #2

Local Co-ordinate Reference: Site MARLENE STEFFAN 1-5-8H-141-97
TVD Reference: WELL @ 2650.90ft (PRECISION 426)
MD Reference: WELL @ 2650.90ft (PRECISION 426)
North Reference: True
Survey Calculation Method: Minimum Curvature

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)
20,200.00	90.00	179.96	10,789.00	-9,656.91	7.50	9,656.92	0.00	0.00	0.00
20,300.00	90.00	179.96	10,789.00	-9,756.91	7.58	9,756.92	0.00	0.00	0.00
20,400.00	90.00	179.96	10,789.00	-9,856.91	7.65	9,856.92	0.00	0.00	0.00
20,500.00	90.00	179.96	10,789.00	-9,956.91	7.73	9,956.92	0.00	0.00	0.00
20,600.00	90.00	179.96	10,789.00	-10,056.91	7.81	10,056.92	0.00	0.00	0.00
20,700.00	90.00	179.96	10,789.00	-10,156.91	7.89	10,156.92	0.00	0.00	0.00
20,800.00	90.00	179.96	10,789.00	-10,256.91	7.96	10,256.92	0.00	0.00	0.00
20,900.00	90.00	179.96	10,789.00	-10,356.91	8.04	10,356.92	0.00	0.00	0.00
21,000.00	90.00	179.96	10,789.00	-10,456.91	8.12	10,456.92	0.00	0.00	0.00
21,100.00	90.00	179.96	10,789.00	-10,556.91	8.20	10,556.92	0.00	0.00	0.00
TD at 21201.33									
21,201.33	90.00	179.96	10,789.00	-10,658.24	8.28	10,658.24	0.00	0.00	0.00

Design Targets

Target Name

- hit/miss target	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
- Shape									
PBHL MARLENE STE	0.00	0.00	10,789.00	-10,658.24	8.28	510,377.54	1,346,280.51	47° 2' 20.556 N	102° 59' 45.521 W
- plan hits target center									
- Point									

Casing Points

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
11,116.04	10,789.00	7"	7	7-1/2



Database: EDM 2003.21 Single User Db
Company: OXY USA
Project: DUNN COUNTY, ND
Site: MARLENE STEFFAN 1-5-8H-141-97
Well: MARLENE STEFFAN 1-5-8H-141-97
Wellbore: MARLENE STEFFAN 1-5-8H-141-97
Design: Design #2

Local Co-ordinate Reference: Site MARLENE STEFFAN 1-5-8H-141-97
TVD Reference: WELL @ 2650.90ft (PRECISION 426)
MD Reference: WELL @ 2650.90ft (PRECISION 426)
North Reference: True
Survey Calculation Method: Minimum Curvature

Formations

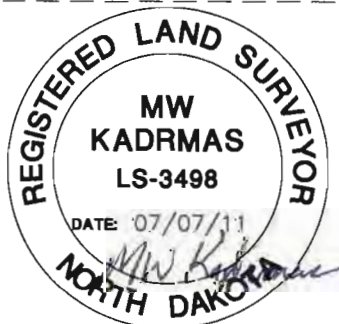
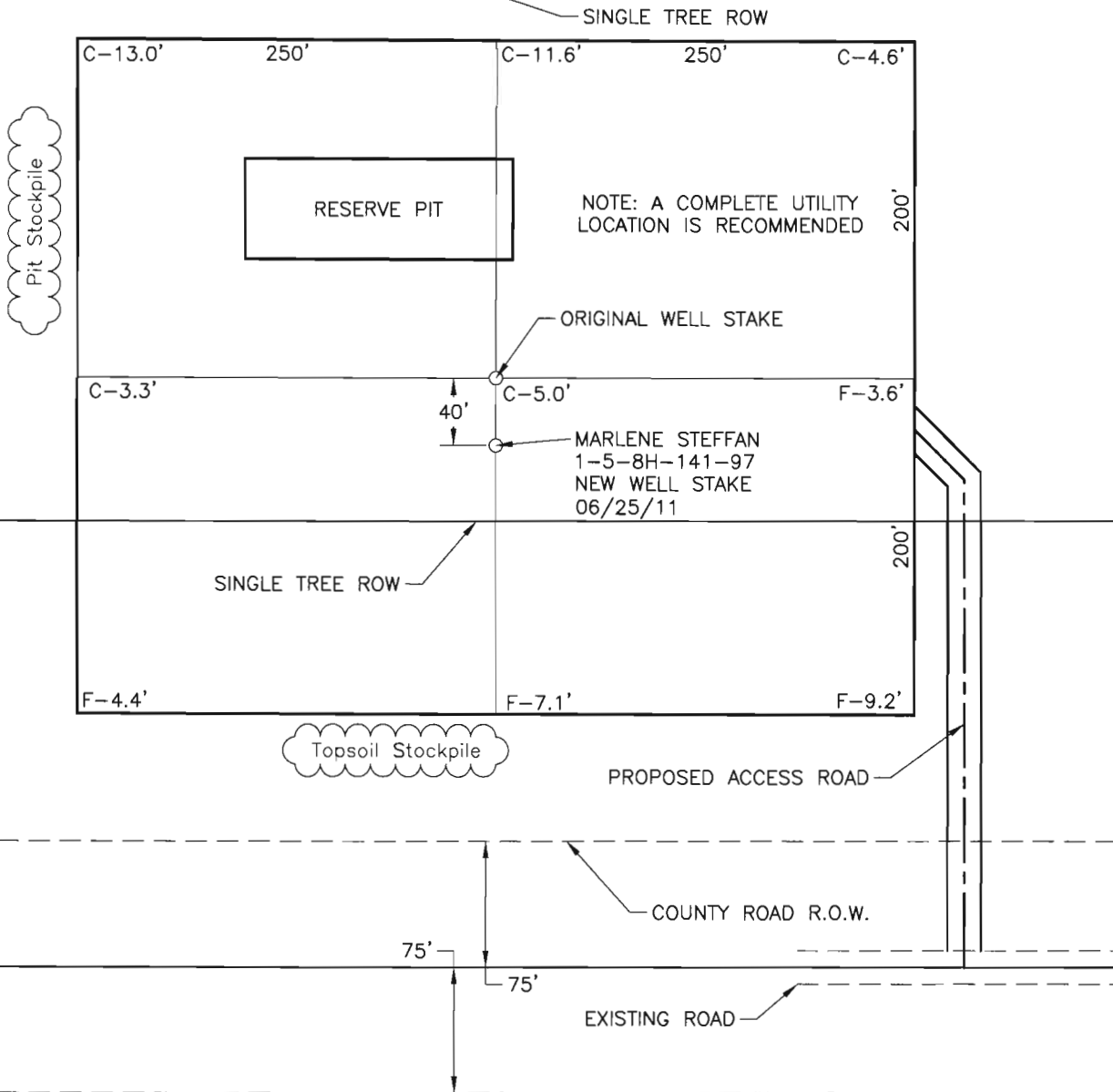
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
2,153.00	2,153.00	PIERRE SHALE		0.00	
4,328.00	4,328.00	MINNEKAHTA		0.00	
4,789.00	4,789.00	GREENHORN		0.00	
5,251.00	5,251.00	MOWRY		0.00	
5,630.00	5,630.00	DAKOTA		0.00	
6,504.00	6,504.00	RIERDON		0.00	
6,896.00	6,896.00	DUNHAM SALT		0.00	
6,966.00	6,966.00	SPEARFISH		0.00	
7,383.00	7,383.00	OPECHE SALT		0.00	
7,756.00	7,756.00	MINNELUSA		0.00	
8,279.00	8,279.00	TYLER		0.00	
8,747.00	8,747.00	KIBBY LIMESTONE		0.00	
8,875.00	8,875.00	MADISON		0.00	
8,902.00	8,902.00	FIRST CHARLES SALT		0.00	
9,179.00	9,179.00	GREENPOINT ANHYDRITE		0.00	
9,283.00	9,283.00	BASE LAST SALT		0.00	
9,452.00	9,452.00	MISSION CANYON		0.00	
9,621.00	9,621.00	FLYBURG GR MARKER		0.00	
9,953.00	9,953.00	LODGEPOLE		0.00	
10,884.89	10,743.00	BAKKEN		0.00	
10,964.21	10,769.00	THREE FORKS		0.00	

Plan Annotations

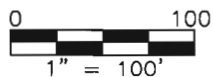
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
10,216.04	10,216.04	0.00	0.00	Start Build 10.00
11,116.04	10,789.00	-572.96	0.44	Start 10085.28 hold at 11116.04 MD
21,201.33	10,789.00	-10,658.24	8.28	TD at 21201.33

DRILL PAD LAYOUT

OXY USA INC.
P.O. BOX 2000, DICKINSON, ND 58601
"MARLENE STEFFAN 1-5-8H-141-97"
310 FEET FROM SOUTH LINE AND 1420 FEET FROM EAST LINE
SEC 32, T142N, R97W, 5TH P.M.
DUNN COUNTY, NORTH DAKOTA



TRUE NORTH



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SHEET
3 OF 6



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P.O. Box 266 Belfield, North Dakota 701-575-2247

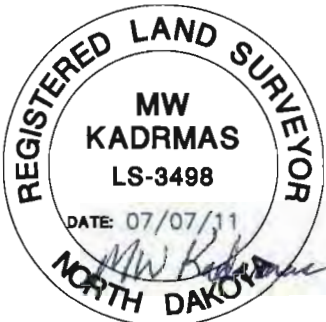
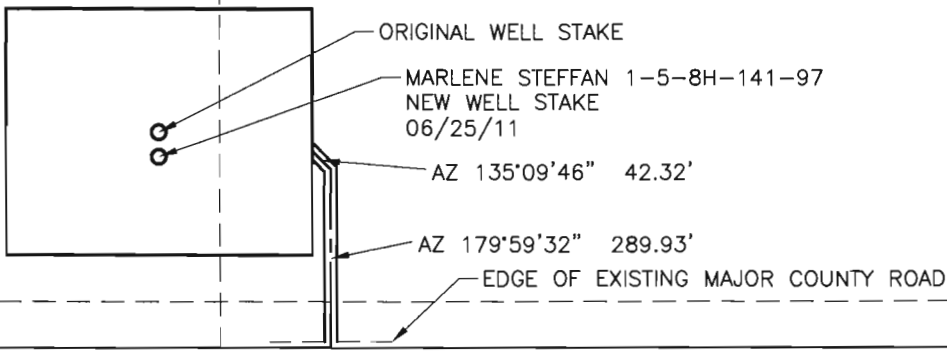
OXY USA INC.
SEC 32, T142N, R97W, 5TH P.M.
DUNN COUNTY, NORTH DAKOTA
Drawn By: J.J.W.
Checked By: M.W.K.
Project No: B11-08-012.01
Date: JULY 2011

Rev	Date	By	Description
1	6/25/11	J.J.W.	WELL MOVE

ACCESS APPROACH

OXY USA INC.
P.O. BOX 2000, DICKINSON, ND 58601
"MARLENE STEFFAN 1-5-8H-141-97"
310 FEET FROM SOUTH LINE AND 1420 FEET FROM EAST LINE
SEC 32, T142N, R97W, 5TH P.M.
DUNN COUNTY, NORTH DAKOTA

S1/2SE1/4 SEC 32
LANDOWNER:
CAROLINE HECKER TRUST
LENGTH=332' (20 RODS)



TRUE NORTH



0 300
1" = 300'

COUNTY ROAD R.O.W.

75'
75'

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OXY USA INC.
SEC 32, T142N, R97W, 5TH P.M.
DUNN COUNTY, NORTH DAKOTA
Drawn By J.J.W.
Checked By M.W.K.
Project No 011-08-012.01
Date JULY 2011

Revisi No.	Date	By	Description
1	6/25/11	J.J.W.	WELL MOVE

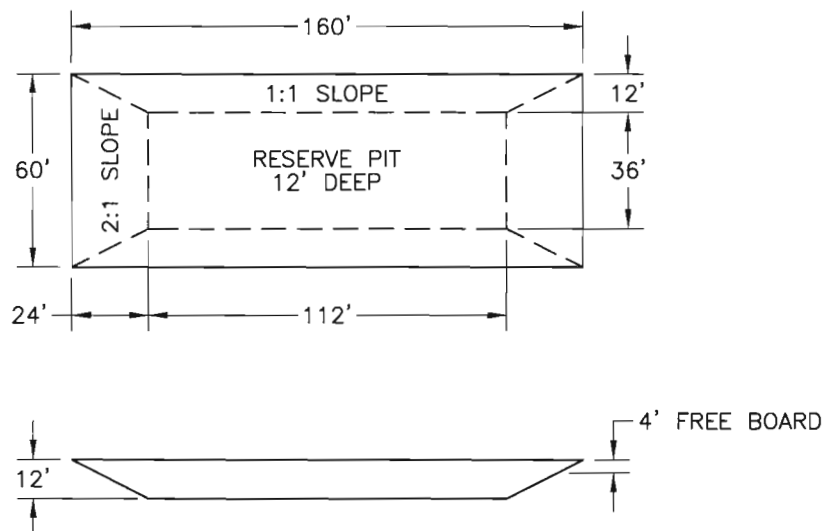
SITE QUANTITIES

OXY USA INC.
P.O. BOX 2000, DICKINSON, ND 58601
"MARLENE STEFFAN 1-5-8H-141-97"
310 FEET FROM SOUTH LINE AND 1420 FEET FROM EAST LINE
SEC 32, T142N, R97W, 5TH P.M.
DUNN COUNTY, NORTH DAKOTA

WELL SITE ELEVATION	2620.0
WELL PAD ELEVATION	2615.0
EXCAVATION	28115
PLUS PIT	<u>3150</u>
	31265
EMBANKMENT	12733
PLUS SHRINKAGE (30%)	<u>3820</u>
	16553
STOCKPILE PIT	3150
STOCKPILE TOP SOIL (6")	3711
STOCKPILE FROM EXCESS EXCAVATION	7851
DISTURBED AREA FROM PAD	4.60 ACRES

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

WELL SITE LOCATION: 310' FSL, 1420' FEL



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SHEET
3A
OF
6



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OXY USA INC.

SEC 32, T142N, R97W, 5TH P.M.
DUNN COUNTY, NORTH DAKOTA

Drawn By J.J.W. Project No 811-08-012.01
Checked By M.W.K. Date JULY 2011

Revise No.	Date	By	Description
1	8/25/11	J.J.W.	WELL MOVE

SECTION BREAKDOWN

OXY USA INC.

P.O. BOX 2000, DICKINSON, ND 58601

MARLENE STEFFAN 1-58H-141-97

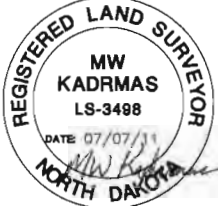
310 FEET FROM SOUTH LINE AND 1420 FEET FROM EAST LINE

SEC 32, T142N, R97W, 5TH P.M.

DUNN COUNTY, NORTH DAKOTA

TRUE NORTH

0 1000
1" = 1000'

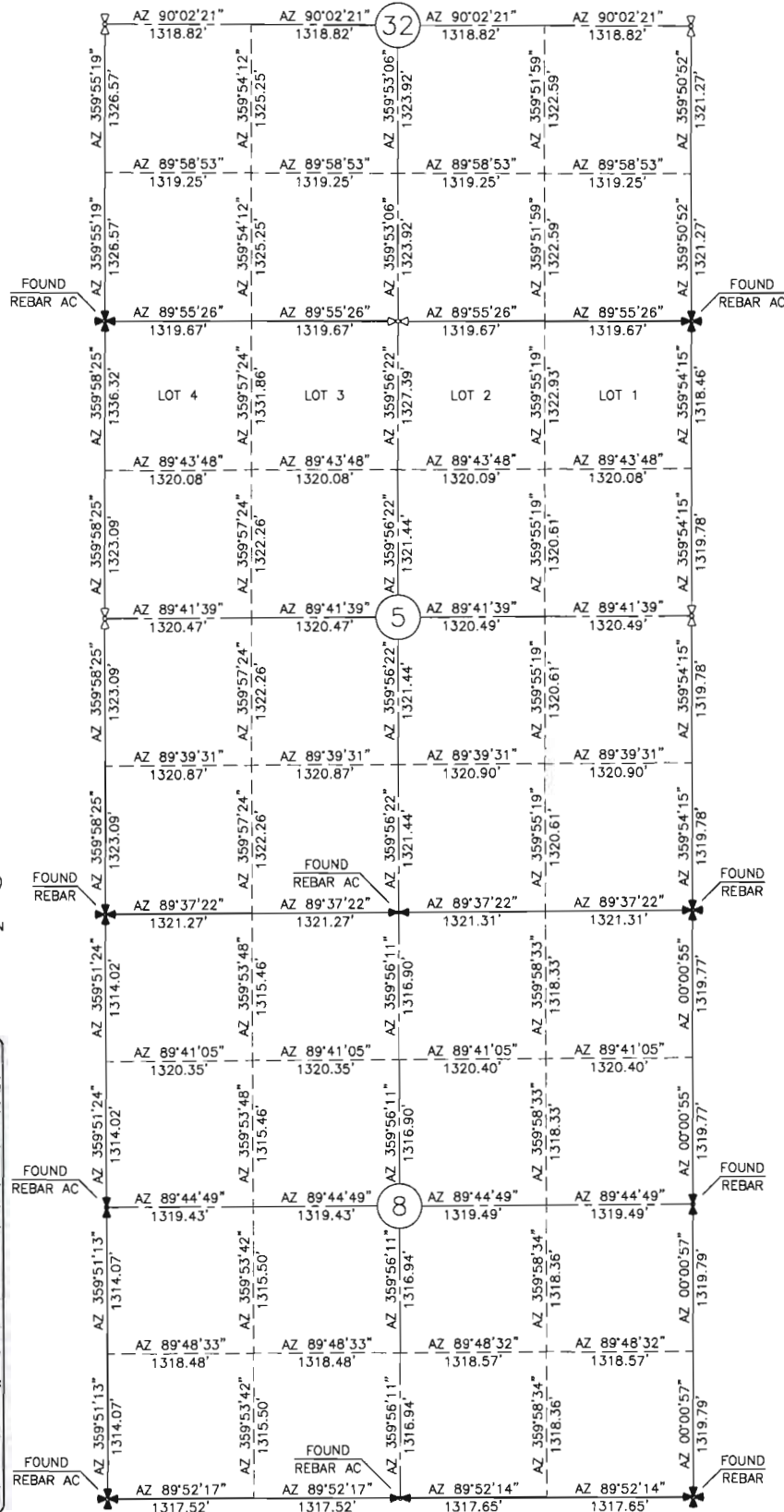
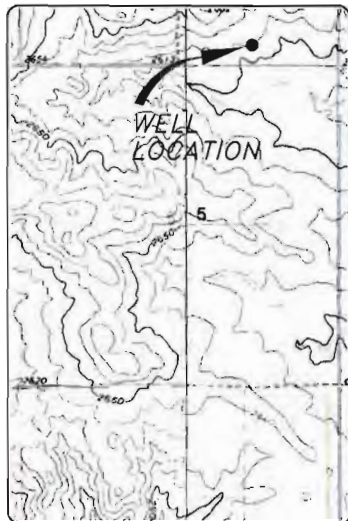


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ALL AZIMUTHS ARE BASED ON G.P.S. DERIVED BEARINGS. THE ORIGINAL SURVEY OF THIS AREA FOR THE GENERAL LAND OFFICE (G.L.O.) WAS 1884. THE CORNERS FOUND ARE AS INDICATED AND ALL OTHERS ARE COMPUTED FROM THOSE CORNERS FOUND AND BASED ON G.L.O. DATA.

- ✕ - MONUMENT - RECOVERED
- ✕ - MONUMENT - NOT RECOVERED

VICINITY MAP



SHEET
2 OF 6



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Engineering - Surveying - Planning

P.O. Box 266 Belfield, North Dakota (701)-575-2247 Fax(701)-575-2251

OXY USA INC.
SECTION BREAKDOWN
SEC 32, T142N, R97W, 5TH P.M.

DUNN COUNTY, NORTH DAKOTA

Drawn By J.J.W. Project No. 811-08-012.01
Checked By M.W.K. Date JULY 2011

Revision No.	Date	By	Description
1	8/25/11	J.J.W.	WELL MOVE

OXY USA INC.
MARLENE STEFFAN 1-5-8H-141-97
310 FSL/1420 FEL
TOPOGRAPHIC MAP
SW1/4SE1/4 SEC. 32, T142N, R97W
DUNN COUNTY, NORTH DAKOTA

WELL
LOCATION

TRUE
NORTH

1" = 2000'

SHEET
5
OF
6



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TOPOGRAPHIC MAP

SEC 32, T142N, R97W, 5TH P.M.

DUNN COUNTY, NORTH DAKOTA

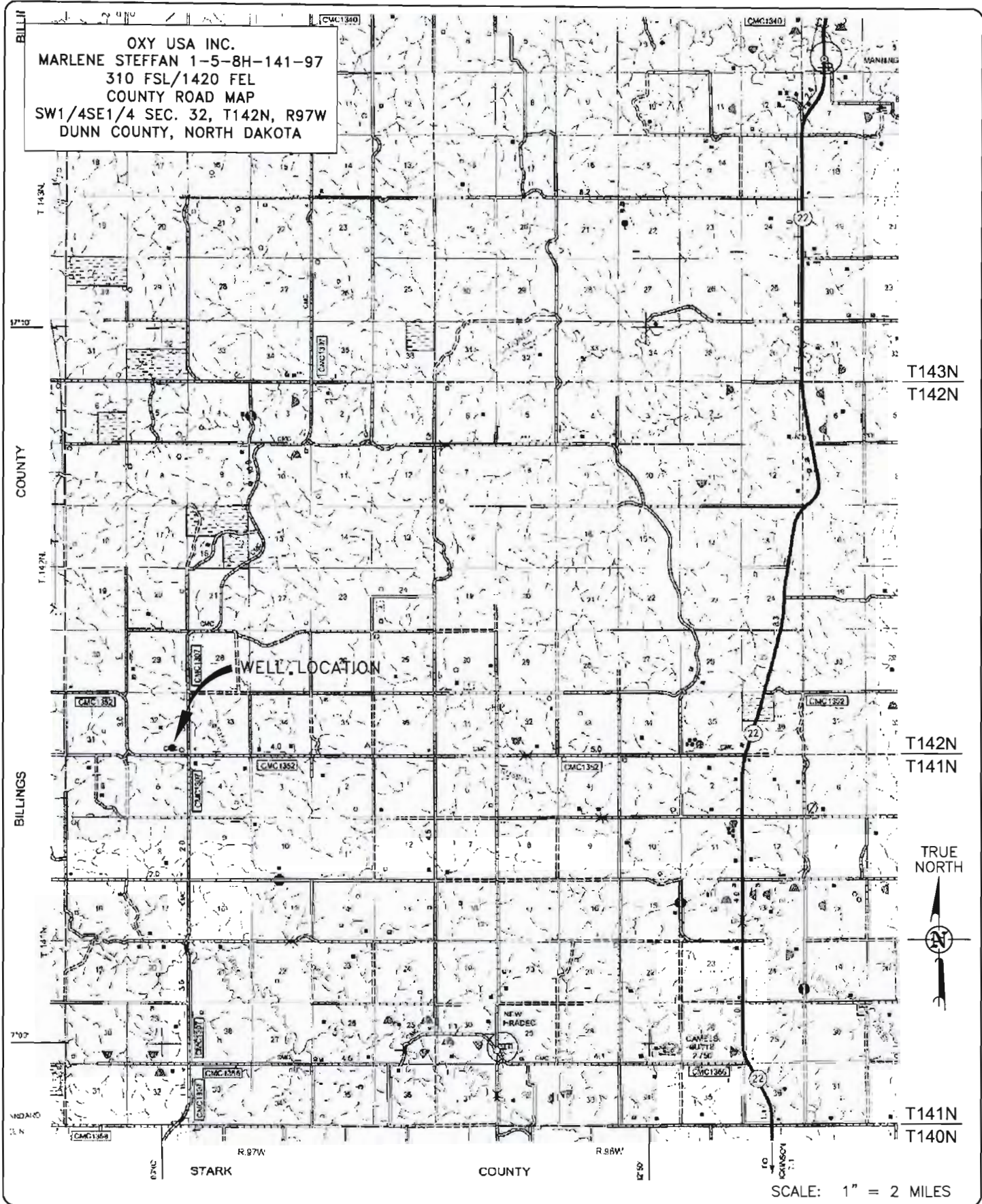
Drawn By J.J.W.

Project No B11-08-012.01

Checked By M.W.K.

Date JULY 2011

Revis No.	Date	By	Description
1	6/25/11	J.J.W.	WELL MOVE



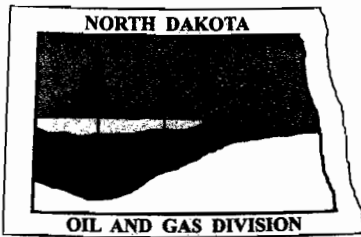
SHEET
6
 OF
6



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 P.O. Box 266 Belfield, North Dakota 701-575-2247

COUNTY ROAD MAP
SEC 32, T142N, R97W, 5TH P.M.
DUNN COUNTY, NORTH DAKOTA
 Drawn By J.J.W. Project No B11-08-012.01
 Checked By M.W.K. Date JULY 2011

Rev. No.	Date	By	Description
1	6/25/11	J.J.W.	WELL MOVE



Oil and Gas Division

Lynn D. Helms - Director

Bruce E. Hicks - Assistant Director

Department of Mineral Resources

Lynn D. Helms - Director

20749

North Dakota Industrial Commission

www.oilgas.nd.gov

May 11, 2011

Joseph DeDominic
OXY USA Inc.
5 Greenway Plaza, Ste 110
Houston, TX 77046

RE: CHANGE OF OPERATOR FROM ANSCHUTZ EXPLORATION CORPORATION
TO OXY USA INC.
30 WELLS

Dear Joseph DeDominic:

Please find enclosed a copy of the approved Form 15, Notice of Transfer of Oil and Gas Wells, in regard to the above-referenced matter. This transfer has now been approved and subject wells are now covered by Bond No. 105480746, Travelers Casualty and Surety Company of America as Surety.

If you should have any questions, please feel free to contact this office.

Sincerely,

Evie Roberson
Administrative Assistant

Enclosure

cc: William Miller
Anschutz Exploration Corporation
555 17th St. Ste 2400
Denver, CO 80202

**NOTICE OF TRANSFER OF OIL AND GAS WELLS - FORM 15**

INDUSTRIAL COMMISSION OF NORTH DAKOTA
OIL AND GAS DIVISION
600 EAST BOULEVARD DEPT 405
BISMARCK, ND 58505-0840
SFN 5762 (03-2000)



FOR STATE USE ONLY

NDIC Bond Number

20749

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

THIS NOTICE ALONG WITH A FEE OF \$25.00 PER WELL SHALL BE FILED AT LEAST THIRTY DAYS BEFORE THE CLOSING DATE OF TRANSFER.

TRANSFERRING OPERATOR

Name of Operator Representative William Miller			
Operator Transferring Oil and/or Gas Wells Anschutz Exploration Corporation			Telephone Number
Address 555 17th Street, Suite 2400	City Denver	State CO	Zip Code 80202
I, the above named representative, acknowledge the transfer of the oil and/or gas wells named below for the purpose of ownership and/or operation to the company named below.			
Signature <i>William Miller</i>		Title (Must be an officer or power of attorney must be attached) President, Anschutz Exploration Corporation	Date April 18, 2011

Well File Number	Requested Official Well Name and Number	Location (Qtr-Qtr, S-T-R)	Assignment Date
	See attached well listing *Transition agreement between Anschutz Exploration Corporation and Oxy USA Inc. is due to expire on June 1, 2011. Oxy USA Inc. to assume operations of the listed wells on May 1, 2011.		May 1, 2011*

RECEIVING OPERATOR

Name of Operator Representative Joseph DeDominic			
Operator Receiving Oil and/or Gas Wells OXY USA Inc.			Telephone Number 713.215.7000
Address 5 Greenway Plaza, Suite 110	City Houston	State TX	Zip Code 77046
I, the above named representative, have read the foregoing statement and accept such transfer, also the responsibility of ownership and/or operation of said well or wells, under the said company bond, said bond being tendered to or on file with the Industrial Commission of North Dakota.			
Signature <i>Joseph DeDominic</i>		Title (Must be an officer or power of attorney must be attached) President & Gen. Manager, Williston Bus. Unit	Date April 19, 2011

SURETY COMPANY

Surety Travelers Casualty and Surety Company of America		Telephone Number 800.252.4633	Amount of Bond \$ 100,000
Address One Tower Square	City Hartford	State CT	Zip Code 06183
		Bond Number 105480746	
The above named SURETY agrees that such bond shall extend to compliance with Chapter 38-08 of North Dakota Century Code and amendments and the rules and regulations of the Industrial Commission of North Dakota prescribed to govern the production of oil and gas on government and private lands within the State of North Dakota, in relation to the above stated transfer; it being further agreed and understood that the bond sum or amount is not to be considered increased because of such extension.			
Signature <i>Lisa A. Ward</i>		Title (Must be an officer or power of attorney must be attached) Attorney-in-Fact	Date April 18, 2011

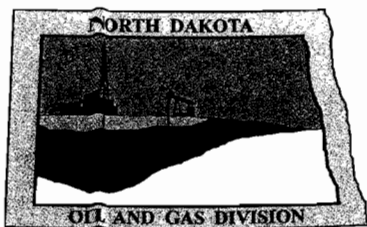
Printed Name
Jennifer K. Sparlak Lisa A. Ward

FOR STATE USE ONLY

Date Approved <i>May 11, 2011</i>
By <i>Bruce E. Hulse</i>
Title <i>Assistant Director</i>

NoN-Activated APDs--AEC to OXY												
Well Name	API	Regulatory Data				Regulatory Data	Location Data					
		North Dakota File No.	Permit date	Status Code	Status		Spot	Section	Township	Range	Field	County
Brian Sadowsky 1-10-3H-142-97	33-025-01336	<u>20572</u>	3/8/2011	5	Permitted		SWSW	10	142N	97W	Willmen	Dunn
Cecilia Stroh 1-18-19H-143-96	33-025-01008	<u>18503</u>	12/10/2009	5	Permitted		NWNE	18	143N	96W	Fayette	Dunn
David Kovash 1-12-13H-142-96	33-025-01279	<u>20278</u>	1/10/2011	5	Location Built		SE SW	1	142N	96W	Manning	Dunn
Delvin Dukart 1-31-30H-143-95	33-025-01183	<u>19726</u>	10/12/2010	5	Permitted		SWSE	31	143N	95W	Manning	Dunn
Dvorak Trust 1-6-31H-142-96	33-025-01300	<u>20416</u>	2/3/2011	5	Permitted		SESW	6	141N	96W	Russian Creek	Dunn
Elizabeth Stroh 1-7-6H-143-96	33-025-01003	<u>18463</u>	11/25/2009	5	Permitted		NWNE	18	143N	96W	Cabernet	Dunn
Elsie Dvorak 1-8-17H-141-96	33-025-01243	<u>20104</u>	11/30/2010	5	Permitted		NWNE	8	141N	96W	St. Anthony	Dunn
George Miller 1-11-2H-142-95	33-025-01360	<u>20765</u>	4/20/2011		Permitted		SWSE	11 (&2)	142N	95W	Murphy Creek	Dunn
George Miller 1-2-11H-142-95	33-025-01314	<u>20473</u>	2/14/2011	5	Permitted		SWSE	35	143N	95W	Murphy Creek	Dunn
Gordon Pavlicek 1-17-20H-141-95	33-025-01238	<u>20092</u>	11/29/2010	5	Permitted		NENW	17	141N	95W	Simon Butte	Dunn
Henry Kovash 1-6-7H-142-95	33-025-01296	<u>20395</u>	2/2/2011	5	Permitted		SWSE	31(&7)	143N	95W	Manning	Dunn
Katie Heiser 1-1-12H-142-95	33-025-01316	<u>20480</u>	2/16/2011	5	Permitted		SWSE	36	143N	95W	Murphy Creek	Dunn
Katie Heiser 1-12-1H-142-95	33-025-01359	<u>20750</u>	4/15/2011		Permitted		SWSE	12 (&1)	142N	95W	Murphy Creek	Dunn
Kudrna 1-17	33-025-01351	<u>20659</u>	4/25/2011	5	Location Built		SWSE	17	141N	97W	St. Anthony	Dunn
Laura Sadowsky 1-1-36H-142-96	33-025-01232	<u>20080</u>	11/24/2010	5	Location Built		SESW	1	142N	96W	Manning	Dunn
Lillian Sadowsky 1-15-22H-142-96	33-025-01283	<u>20300</u>	1/13/2011	5	Permitted		SESW	10	142N	96W	Manning	Dunn
Louis Sadowsky 1-10-3H-142-96	33-025-01209	<u>19877</u>	11/1/2010	5	Permitted		SESW	10	142N	96W	Manning	Dunn
Marsh State 1-34-27H-142-97	33-025-01308	<u>20441</u>	2/8/2011	5	Permitted		SESW	34 (&27)	142N	97W	Willmen	Dunn
Marlene Steffan 1-5-8H-141-97	33-025-01358	<u>20749</u>	4/15/2011		Permitted		SWSE	5 (&8)	141N	97W	St Anthony	Dunn
Mildred Sadowsky 1-14-11H-142-97	33-025-01335	<u>20571</u>	3/8/2011	5	Permitted		SESW	14	142N	97W	Willmen	Dunn

NoN-Activated APDs--AEC to OXY												
Well Name	API	Regulatory Data				Regulatory Data	Location Data					
		North Dakota File No.	Permit date	Status Code	Status		Spot	Section	Township	Range	Field	County
Polensky State 1-35-36H-142-97	33-025-01304	<u>20425</u>	2/4/2011	5	Permitted		NWSW	35	142N	97W	Willmen	Dunn
Ralph Tormaschy 1-8-5H-142-96	33-025-01340	<u>20585</u>	3/10/2011	5	Permitted		NWNE	17	142N	96W	Manning	Dunn
Rebsom 1-23-14H-143-95	33-025-01216	<u>19914</u>	11/3/2010	5	Permitted		SESWSE	23	143N	96W	Murphy Creek	Dunn
Sharon Rainey 1-17-20H-142-96	33-025-01339	<u>20584</u>	3/10/2011	5	Permitted		NWNE	17	142N	96W	Manning	Dunn
State Dvorak 1- 9-16H-141-96	33-025-01263	<u>20218</u>	12/22/2010	5	Permitted		NWNE	9	141N	96W	St. Anthony	Dunn
Steve Kudrna 1-32-29H-143-95	33-025-01135	<u>19234</u>	7/8/2010	5	Permitted		SWSE	32	143N	95W	Manning	Dunn
Terry Dvorak 1-15-22H-142-95	33-025-01337	<u>20580</u>	3/8/2011	5	Permitted		NENE	15 (&22)	142N	95W	Murphy Creek	Dunn
Tony Kralicek 1-5-8H-142-95	33-025-01282	<u>20299</u>	1/12/2011	5	Permitted		SWSE	32	143N	95W	Manning	Dunn
Tuhy State 1-36-25H-143-95	33-025-01315	<u>20479</u>	2/16/2011	5	Permitted		SWSE	36	143N	95W	Murphy Creek	Dunn
Watkins State 1-35-26H-143-95	33-025-01313	<u>20472</u>	2/14/2011	5	Permitted		SWSE	35	143N	95W	Murphy Creek	Dunn



Oil and Gas Division 20749

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

JAMES P. OURSLAND
ANSCHUTZ EXPLORATION CORPORATION
555 17TH STREET SUITE 2400
DENVER, CO 80202 USA

Date: 4/19/2011

RE: CORES AND SAMPLES

Well Name: **MARLENE STEFFAN 1-5-8H-141-97** Well File No.: **20749**
Location: **SWSE 32-142-97** County: **DUNN**
Permit Type: **Development - HORIZONTAL**
Field: **ST. ANTHONY** Target Horizon: **THREE FORKS**

Dear James P. Oursland:

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

#20749

AFFIDAVIT

State of NORTH DAKOTA)
)ss:
County of DUNN)

I, Keith W. Pierson, do swear and affirm that the following Statement is true and correct to the best of my knowledge and belief.

STATEMENT

I am a Right-of-Way Agent, employed by EMPIRE OIL COMPANY, whose post office address is PO Box 1835, Williston, ND 58802, and have been so employed since August, 2005. My responsibilities, in this role as a Right-of-Way Agent, include obtaining certain rights from surface landowners so as to permit oil and gas operations by OXY USA Inc., whose post office address is 5 Greenway Plaza, Suite 110, Houston, TX 77046-0521.

On March 4th, 2011 as a Right-of-Way Agent of EMPIRE OIL COMPANY, as a representative of OXY USA Inc., I did obtain a Surface Use Agreement from Caroline Hecker, as Trustee of the Caroline Hecker Revocable Trust dated December 9, 1999, whose post office address is 731 - 22nd Street West, Dickinson, ND 58601, Howard A. Hecker, a single man, whose post office address is 2380 - 117th Avenue SW, Dickinson, ND 58601, and Maurice Hecker, a single man, whose post office address is 11659 - 22nd Street SW, Dickinson, ND 58601, as Grantor, for the following property in Dunn County, North Dakota:

Township 142 North, Range 97 West
Section 32: S2SE

The purpose of said Surface Use Agreement was for the right to use, occupy, construct, maintain, repair and replace well sites, tank batteries, and roads on the property as reasonably requested by OXY USA Inc. for its operations on the property, and other operations in the vicinity of the property, including without limitation the disposal of drill cuttings resulting from such operation in accordance with all applicable state and federal laws, rules, and regulations.

OXY USA Inc. will drill and operate 1 well from this location:

Marlene Steffan 1-5-8H-141-97 Well

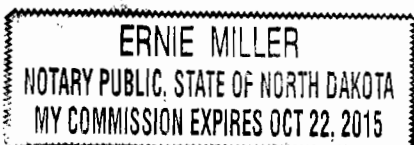
Sworn this 8th day of March, 2011.

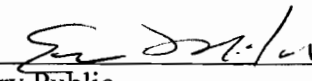


Keith W. Pierson, Right-of-Way Agent
EMPIRE OIL COMPANY, as a representative of
OXY USA Inc.

STATE OF NORTH DAKOTA)
)ss:
COUNTY OF STARK)

The foregoing instrument was acknowledged before me this 8th day of March, 2011, by Keith W. Pierson, as a Right-of-Way Agent of EMPIRE OIL COMPANY as a representative of OXY USA Inc., a corporation, on behalf of the OXY USA Inc.





Notary Public
Oct. 22, 2015
My Commission Expires:



Oil and Gas Division

Lynn D. Helms - Director

Bruce E. Hicks - Assistant Director

Department of Mineral Resources

Lynn D. Helms - Director

North Dakota Industrial Commission

www.oilgas.nd.gov

April 15, 2011

Christine Campbell
Geoscience Technician
ANSCHUTZ EXPLORATION CORPORATION
555 17th Street, Suite 2400
Denver, CO 80202

**RE: HORIZONTAL WELL
MARLENE STEFFAN 1-5-8H-141-97
SWSE Section 32-142N-97W
Dunn County
Well File # 20749**

Dear Christine:

Pursuant to Commission Order No. 15207, 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 **1220' setback** (per Commission policy) from the east & west boundaries within the 1280 acre spacing unit consisting of Sections 5 and 8-T141N-R97W.

PERMIT STIPULATIONS: In cases where a spacing unit is accessed from an off-site drill pad, an affidavit must be provided affirming that the surface owner of the pad agrees to accept burial on their property of the cuttings generated from drilling the well into an offsite spacing unit. ANSCHUTZ EXPLORATION CORPORATION must run open hole logs to include a porosity and resistivity log from KOP to the base of the surface casing. ANSCHUTZ EXPL CORP must contact NDIC Field Inspector Rick Hutchens at 701-290-7425 prior to location construction.

Location Construction Commencement (Three Day Waiting Period)

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

Permit Fee & Notification

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

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

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

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

Reserve pit

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

Surface casing cement

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

Logs

NDAC Section 43-02-03-31 requires the running of a Cement Bond Log from which the presence of cement can be determined in every well in which production or intermediate casing has been set and a Gamma Ray Log must be run from total depth to ground level elevation of the well bore. All logs must be submitted as one paper copy and one digital copy in LAS (Log ASCII) format, or a format approved by the Director. Image logs that include, but are not limited to, Mud Logs, Cement Bond Logs, and Cyberlook Logs, cannot be produced in their entirety as LAS (Log ASCII) files. To create a solution and establish a standard format for industry to follow when submitting image logs, the Director has given approval for the operator to submit an image log as a TIFF (*.tif) formatted file. The TIFF (*.tif) format will be accepted only when the log cannot be produced in its entirety as a LAS (Log ASCII) file format. The digital copy may be submitted on a 3.5" floppy diskette, a standard CD, or attached to an email sent to digitallogs@nd.gov

Thank you for your cooperation.

Sincerely,

David Tabor
Engineering Technician III



APPLICATION FOR PERMIT TO DRILL HORIZONTAL WELL - FORM 1H

INDUSTRIAL COMMISSION OF NORTH DAKOTA
OIL AND GAS DIVISION
600 EAST BOULEVARD DEPT 405
BISMARCK, ND 58505-0840
SFN 54269 (08-2005)

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

Type of Work New Location	Type of Well Oil & Gas	Approximate Date Work Will Start 4 / 22 / 2011	Confidential Status No
Operator ANSCHUTZ EXPLORATION CORPORATION			Telephone Number 303-298-1000
Address 555 17th Street, Suite 2400		City Denver	State CO Zip Code 80202

☒ 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 MARLENE STEFFAN				Well Number 1-5-8H-141-97			
Surface Footages 350 F S L 1420 F E L		Qtr-Qtr SWSE	Section 32	Township 142 N	Range 97 W	County Dunn	
Longstring Casing Point Footages 223 F S L 1420 F E L		Qtr-Qtr SWSE	Section 32	Township 142 N	Range 97 W	County Dunn	
Longstring Casing Point Coordinates From Well Head 573 S From WH 0 E From WH		Azimuth 179.9 °	Longstring Total Depth 11116 Feet MD 10789 Feet TVD				
Bottom Hole Footages From Nearest Section Line 212 F S L 1413 F E L		Qtr-Qtr SWSE	Section 8	Township 141 N	Range 97 W	County Dunn	
Bottom Hole Coordinates From Well Head 10696 S From WH 7 E From WH		KOP Lateral 1 10216 Feet MD	Azimuth Lateral 1 179.9 °		Estimated Total Depth Lateral 1 21240 Feet MD 10789 Feet TVD		
Latitude of Well Head 47 ° 04 ' 06.15 "		Longitude of Well Head -102 ° 59 ' 45.64 "		NAD Reference WGS84	Description of (Subject to NDIC Approval) Spacing Unit: Sections 5 and 8-T141N-R97W		
Ground Elevation 2620 Feet Above S.L.	Acres in Spacing/Drilling Unit 1280	Spacing/Drilling Unit Setback Requirement 200 Feet N/S 1220 Feet E/W			Industrial Commission Order 15207		
North Line of Spacing/Drilling Unit 5279 Feet	South Line of Spacing/Drilling Unit 5270 Feet	East Line of Spacing/Drilling Unit 10557 Feet			West Line of Spacing/Drilling Unit 10562 Feet		
Objective Horizons Three Forks					Pierre Shale Top 2153		
Proposed Surface Casing	Size 9 - 5/8 "	Weight 36 Lb./Ft.	Depth 2253 Feet	Cement Volume 726 Sacks	NOTE: Surface hole must be drilled with fresh water and surface casing must be cemented back to surface.		
Proposed Longstring Casing	Size 7 - "	Weight(s) 26&32 Lb./Ft.	Longstring Total Depth 11116 Feet MD 10789 Feet TVD		Cement Volume 656 Sacks	Cement Top 5130 Feet	Top Dakota Sand 5630 Feet
Base Last Charles Salt (If Applicable) 9283 Feet		NOTE: Intermediate or longstring casing string must be cemented above the top Dakota Group Sand.					
Proposed Logs RES & BHC base of surf csg to KOP, DN 7000' to KOP, GR Surf to KOP							
Drilling Mud Type (Vertical Hole - Below Surface Casing) Other - See Comments				Drilling Mud Type (Lateral) Other - See Comments			
Survey Type in Vertical Portion of Well Continuous Every 100 Feet		Survey Frequency: Build Section 30 Feet		Survey Frequency: Lateral 90 Feet		Survey Contractor Pathfinder	

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

Oil based mud to be used below surface casing and water w/polymer sweeps for lateral.

Lateral 2

KOP Lateral 2 Feet MD	Azimuth Lateral 2 °	Estimated Total Depth Lateral 2 Feet MD	Feet TVD	KOP Coordinates From Well Head From WH		From WH
Formation Entry Point Coordinates From Well Head From WH		Bottom Hole Coordinates From Well Head From WH				
KOP Footages From Nearest Section Line F L	F L	Qtr-Qtr	Section	Township N	Range W	County
Bottom Hole Footages From Nearest Section Line F L	F L	Qtr-Qtr	Section	Township N	Range W	County

Lateral 3

KOP Lateral 3 Feet MD	Azimuth Lateral 3 °	Estimated Total Depth Lateral 3 Feet MD	Feet TVD	KOP Coordinates From Well Head From WH		From WH
Formation Entry Point Coordinates From Well Head From WH		Bottom Hole Coordinates From Well Head From WH				
KOP Footages From Nearest Section Line F L	F L	Qtr-Qtr	Section	Township N	Range W	County
Bottom Hole Footages From Nearest Section Line F L	F L	Qtr-Qtr	Section	Township N	Range W	County

Lateral 4

KOP Lateral 4 Feet MD	Azimuth Lateral 4 °	Estimated Total Depth Lateral 4 Feet MD	Feet TVD	KOP Coordinates From Well Head From WH		From WH
Formation Entry Point Coordinates From Well Head From WH		Bottom Hole Coordinates From Well Head From WH				
KOP Footages From Nearest Section Line F L	F L	Qtr-Qtr	Section	Township N	Range W	County
Bottom Hole Footages From Nearest Section Line F L	F L	Qtr-Qtr	Section	Township N	Range W	County

Lateral 5

KOP Lateral 5 Feet MD	Azimuth Lateral 5 °	Estimated Total Depth Lateral 5 Feet MD	Feet TVD	KOP Coordinates From Well Head From WH		From WH
Formation Entry Point Coordinates From Well Head From WH		Bottom Hole Coordinates From Well Head From WH				
KOP Footages From Nearest Section Line F L	F L	Qtr-Qtr	Section	Township N	Range W	County
Bottom Hole Footages From Nearest Section Line F L	F L	Qtr-Qtr	Section	Township N	Range W	County

I hereby swear or affirm the information provided is true, complete and correct as determined from all available records.		Date 4 / 11 / 2011
ePermit	Printed Name Christine Campbell	Title Geoscience Technician

FOR STATE USE ONLY

Permit and File Number 20749	API Number 33 - 025 - 01358
Field ST. ANTHONY	
Pool BAKKEN	Permit Type DEVELOPMENT

FOR STATE USE ONLY

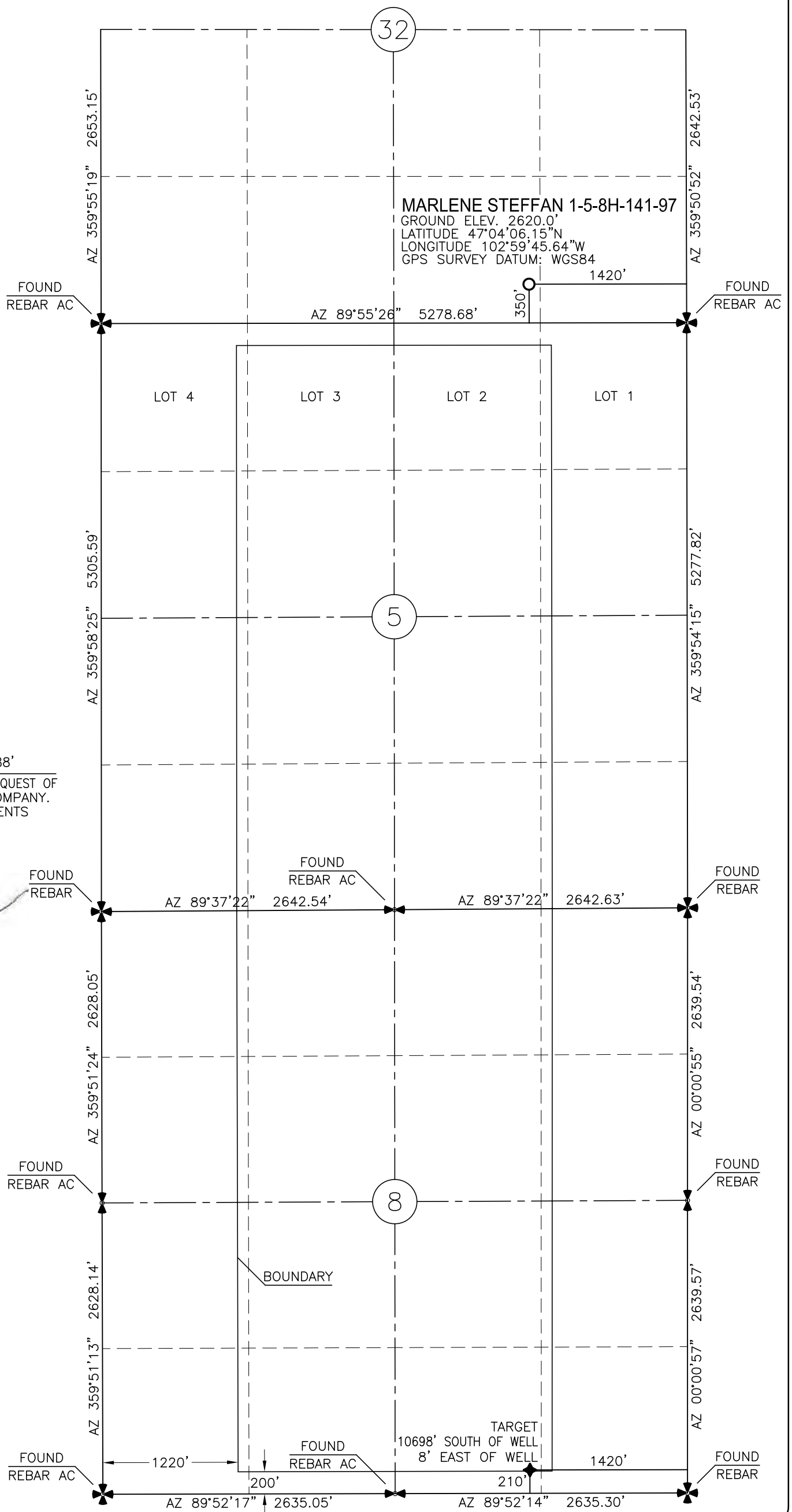
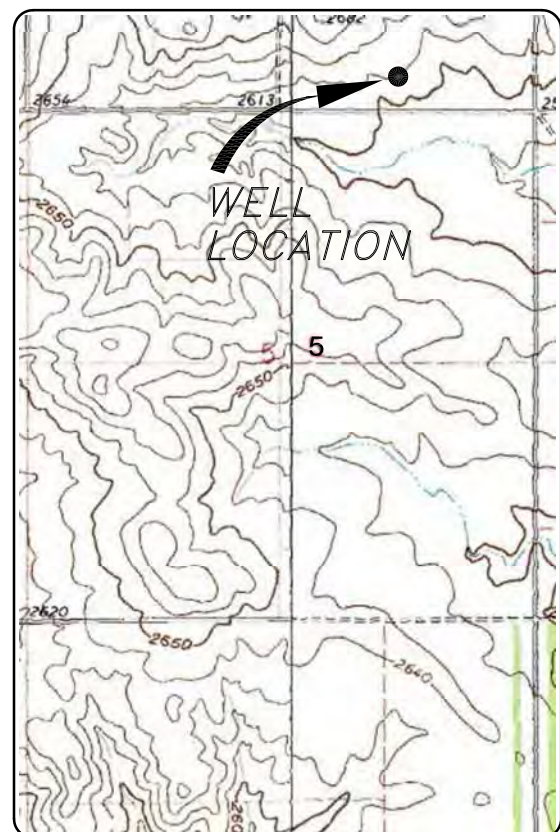
Date Approved 4 / 15 / 2011
By David Tabor
Title Engineering Technician III

ANSCHUTZ EXPLORATION COMPANY
555 17TH STREET, SUITE 2400, DENVER, CO 80202
"MARLENE STEFFAN 1-5-8H-141-97"
350 FEET FROM SOUTH LINE AND 1420 FEET FROM EAST LINE
SEC 32, T142N, R97W, 5TH P.M.
DUNN COUNTY, NORTH DAKOTA



STAKED ON 02/17/11
VERTICAL CONTROL DATUM WAS BASED UPON
CONTROL POINT 2 WITH AN ELEVATION OF 2686.88'

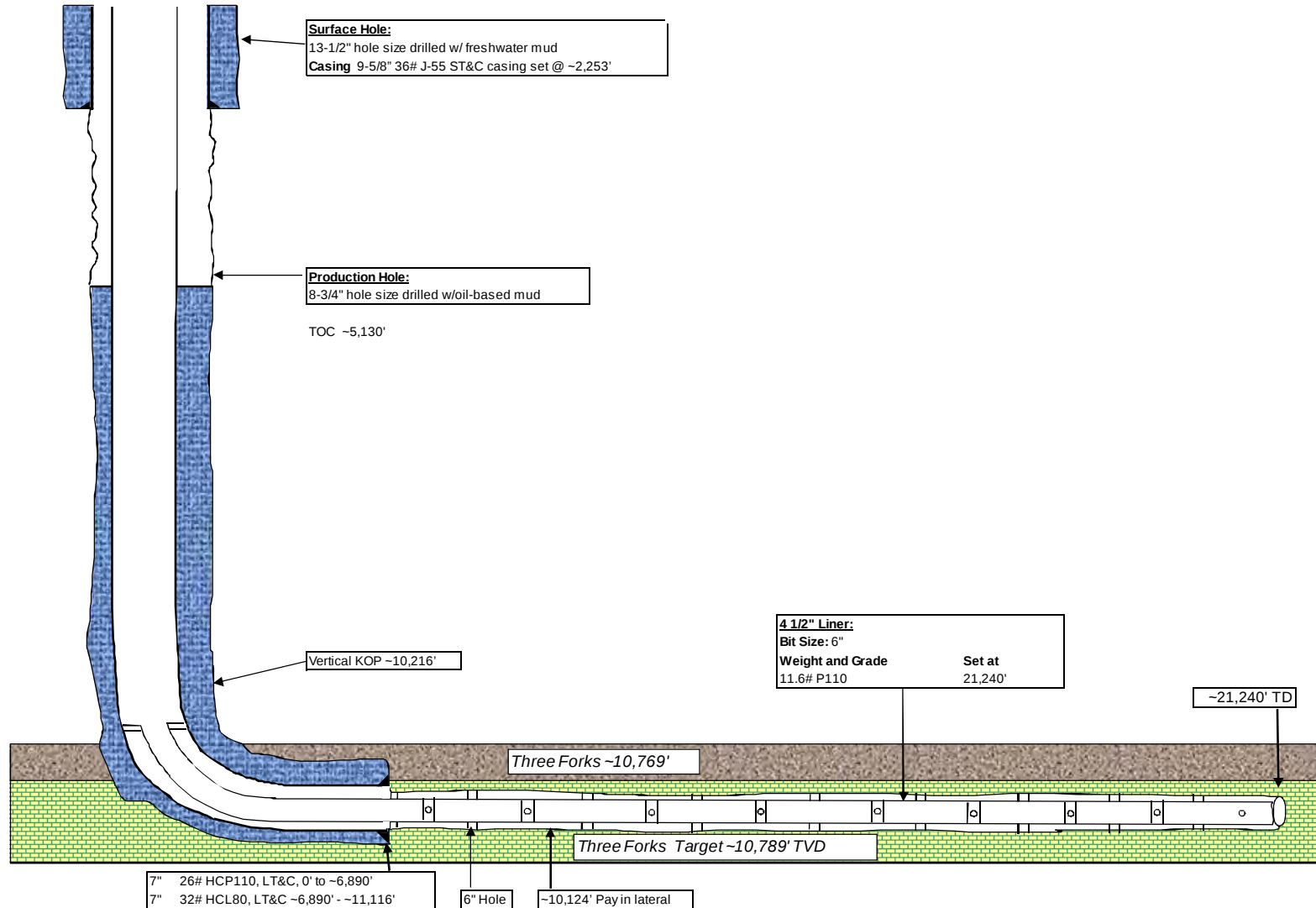
Mark W Kadumac

VICINITY MAP



Marlene Steffan 1-5-8H-141-97
 SHL: 350 ft FSL; 1420 ft FEL Sec 32
 SWSE Sec 32 T142N-R97W
 Elevation: 2,620' GL ~2,653' KB
 Dunn County, ND

r9/15/2009



Anschutz Exploration Corporation

Well Prognosis

GENERAL INFORMATION

		AFE No.	Date 4/7/2011	
Lease/Well Name & Number: Marlene Steffan 1-5-8H-141-97		APC Prospect Number		
Prospect Name: Three Forks		API No.		
Location:	SW SE Sec 32 T142N R97W, Black Hills Meridian	Sec.	Twp.	Rng.
County:	Dunn			
State:	North Dakota			
Surface Loc:	350 ft FSL, 1420 ft FEL	32	142N	97W
Zone Entry:	210 ft FNL, 1420 ft FEL	5	141N	97W
Lateral 1 BHL:	210 ft FSL, 1420 ft FEL	8	141N	97W
Spacing:	1280 acres	5 & 8	141N	97W
Location Directions:				
Elevation	GL 2,620'	KB 2,653'	GL elevation from survey; KB estimated.	

GEOLOGICAL INFORMATION

Proposed TD	10,789' TVD 21,240' MD	Primary Objective Three Forks	Secondary Objective
		Type Production (oil or gas) Oil	Type Production (oil or gas)

Anticipated Formation Tops				
Reference Elevation:		2,653' KB		
Formation Name	Lithology	Top (md)	Top (TVD)	Comment
Pierre Shale			2153	Pierre depth - est. from state map
Greenhorn			4789	
Mowry			5251	
Dakota			5630	
Rierdon			6504	
Dunham Salt	SALT		6896	Gross salt interval: 0 to 100'
Spearfish			6966	
Minnekahta			7328	
Opeche salt	SALT		7383	Gross salt interval: 0?
Minnelusa			7756	
Tyler			8279	R.U. Mudlogger
Kibbey Limestone			8747	
Madison			8875	
First Charles Salt	SALT		8902	Gross salt interval: 670'
Greenpoint Anhydrite	Anhydrite		9179	
Base last salt	SALT		9283	
Mission Canyon	Limestone		9452	
Fryburg GR Marker			9621	KOP: 10,216'
Lodgepole			9953	
Bakken			10743	Target: 10,789'
Three Forks			10769	
Target			10,789'	

Open Hole Logging Program			
Type Log Suite	Interval Top	Interval Bottom	Log Scale
Resistivity	Base of surface casing	KOP	
Density-Neutron	7,000'	KOP	
Gamma Ray	Surface	KOP	
Note - GR to surface required by State of North Dakota			
BHC	Base of surface casing	KOP	

Coring Program			
Core No.	Formation	Est. Depth	Core Length (ft)
	no cores anticipated		

DrillStem Test Program							
Formation	Estimated Depth (ft)	Estimated Pressure (psi)	Cushion (ft)	Test Times (min)			
				Initial Flow	Initial Shut-in	Second Flow	Second Shut-in
Fryburg (Madison)	9621	4300		15	60	120	180

Wellsite Geology			
Service	Description of Services	Start Depth	End Depth
Mudlogger / Geologist	Chromatograph supplied by wellsite geologist	7,000'	TD
	7000 ft to TD		

Sample Collection			
Depth Interval		Foot per Sample	Special Instructions
Top	Base		
Base surf csg	9,200'	30 foot samples	One complete set of cleaned and dried samples
9,200'	Bakken (Csg. Pt.)	10 foot samples	Two sets through turn
Bakken (Cag. Pt.)	TD	30 foot samples	Two sets

ENGINEERING INFORMATION

Mud Program				
Interval	Mud Description	Weight	Viscosity	Wtr Loss
Surface to 2,253'	Water, gel w/ polymer sweeps	8.6 - 8.9	NC	NC
2,253' to 6,890'	Oil Base Mud	9.5 - 9.6	4 to 12 cp	< 40
6,890' to 11,116'	Oil Base Mud	9.5 - 9.6	10 - 16 c	< 40
11,116' to TD	Water w/ polymer sweeps	9.0 - 12	NC	NC

Casing Program					
Hole Size (in)	Casing Size (in)	Casing Weight & Grade	Setting Depth (ft)	Thread	Notes
13 1/2	9 5/8	36# J55	0' - 2,253'	ST&C	20 surface centralizers total
8 3/4	7	26# HCP110	0' - 6,890'	LT&C	58 production centralizers total
8 3/4	7	32# HCL80	6,890' - 11,116'	LT&C	All salts to be covered by 32 ppf pipe
					Do NOT run any 32 ppf pipe above 26 ppf pipe
6	4 1/2	11.6# P110	10,916' - 21,240'	LT&C	Packers Plus Assy.

Cementing Program		
(Permit data only, see service company procedure)		
String	Cement Depth (ft)	Type and Amount
Surface Lead	0' - 1,953'	503 sx Control Set C w/ 1% CaCl ₂ , 0.25 lbs/sk cellophane flakes, 1% OGC-60, 1% SMS, 17.46 ga/sk water. 11.5 ppg & 2.85 cf/sk.
Surface Tail	1,953' - 2,253'	223 sx Class G w/ 0.25 lbs/sack cello flake, 1% CaCl ₂ . 15.8 ppg & 1.15 cf/sk.
Surface Topout		Class G as needed to get cement back to surface
Production Lead 1	5,130' - 8,402'	361 sx WBL w/ 0.5% CFL-4, 0.7% LTR, 0.3% DDF-2, 0.25 lb per sk PS flake (additives to be adjusted based on final testing). 12.0 ppg & 2.54 cf/sack.
	-	
Production Tail	8,402' - 10,789'	295 sx Thermal 35 + 0.8% CFR, 0.7% CFL-2, 0.1% LTR, 3% KCl (BWOW) + 0.25 lb/sk celloflake (additives to be adjusted based on final testing). 15.6 ppg & 1.58 cf/sack.

Completion Program
The Bakken formation will be fracture stimulated and production tested.

Pressure and Pressure Control
Estimated bottomhole pressure is 7400 psi.
BOP equipment will consist of an 11" hydraulic double ram with a 5000 psi working pressure hydraulic actuated double ram and an annular preventer with choke manifold and kill line.

Other Notes
Anschutz Exploration Corporation intends to survey a portion of the lateral for the subject well allowing up to 2.8 degrees of error in the azimuth measurement, relative to the standard tool error of less than 1 degree.
Due to the orientation of the earth's magnetic field, it is more difficult to obtain azimuth readings when drilling horizontally with an east-west orientation. To obtain this reading with less than 1 degree of error, a 30' monel collar must be added to reduce the interference seen by the MWD tool. The addition of this collar places the MWD tool an additional 30' from the bit, which makes steering more difficult. (The results of slides are seen 30' later.) Adding a 10' monel collar in place of the 30' collar increases the maximum error to 2.8 degrees. AEC will account for this amount of error while monitoring the well's path relative to the required setbacks.

Company Contacts

	Name	Office Phone	Mobile/Pager/Cellular	Home Phone
Operations				
	Jerry Gentry jerry.gentry@aec-denver.com	(303) 299-1231	(303) 915-0651	
Geology	George Carlstrom George.Carlstrom@aec-denver.com	(303) 299-1517	(303) 506-1201	(303) 741-1249
Engineering	Galen Brenize	(303) 299-1269	(303) 249-1931	
Rig				
Field				

Special Instructions:

Prepared By:

	<u>Name & Title</u>	<u>Date</u>
Geology	George Carlstrom Geologist	4/7/2011
Seismic		
Engineering		
Operations	Jerry Gentry Drilling Manager	4/8/2011
Land		

Participating Companies

[illegible]



Company: Anschutz Exploration Corp.
Field: Dunn Co., ND
Location: Sec.32-T142N-R97W
Well: Marlene Steffan 1-5-8H-141-97
Wellbore #1



Plan: Plan #1 (Marlene Steffan 1-5-8H-141-97/Wellbore #1)

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	DLeg	TFace	VSec	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	10216.0	0.00	0.00	10216.0	0.0	0.0	0.00	0.00	0.0	
3	11116.0	90.00	179.96	10789.0	-573.0	0.4	10.00	179.96	573.0	PBHL Marlene Steffan 1-5-8H-141-97
4	21239.7	90.00	179.96	10789.0	-10696.7	7.4	0.00	0.00	10696.7	PBHL Marlene Steffan 1-5-8H-141-97

WELL DETAILS: Marlene Steffan 1-5-8H-141-97

+N/-S	+E/-W	Northing	Ground Level:	Latitude	Longitude	Slot
0.0	0.0	521070.13	2620.0	47° 4' 6.150 N	102° 59' 45.640 W	

WELLBORE TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Shape
PBHL Marlene Steffan 1-5-8H-141-97	10789.0	-10696.7	7.4	Point

ANNOTATIONS

TVD	MD	Annotation
10216.0	10216.0	KOP / Start Build 10.00°
10789.0	11116.0	Start 10123.7 hold at 11116.0 MD
10789.0	21239.7	TD at 21239.7

FORMATION TOP DETAILS

TVDPath	MDPath	Formation
2153.0	2153.0	Pierre Shale
4789.0	4789.0	Greenhorn
5251.0	5251.0	Mowry
5630.0	5630.0	Dakota
6504.0	6504.0	Rierdon
6896.0	6896.0	Dunham Salt
6966.0	6966.0	Spearfish
7328.0	7328.0	Minnekahta
7383.0	7383.0	Opeche salt
7756.0	7756.0	Minnelusa
8279.0	8279.0	Tyler
8747.0	8747.0	Kibbey Limestone
8875.0	8875.0	Madison
8902.0	8902.0	First Charles Salt
9179.0	9179.0	Greenpoint Anhydrite
9283.0	9283.0	Base last salt
9452.0	9452.0	Mission Canyon
9621.0	9621.0	Fryburg GR Marker
9953.0	9953.0	Lodgepole
10743.0	10885.0	Bakken
10769.0	10964.3	Three Forks
10789.0	11116.0	Target

CASING DETAILS

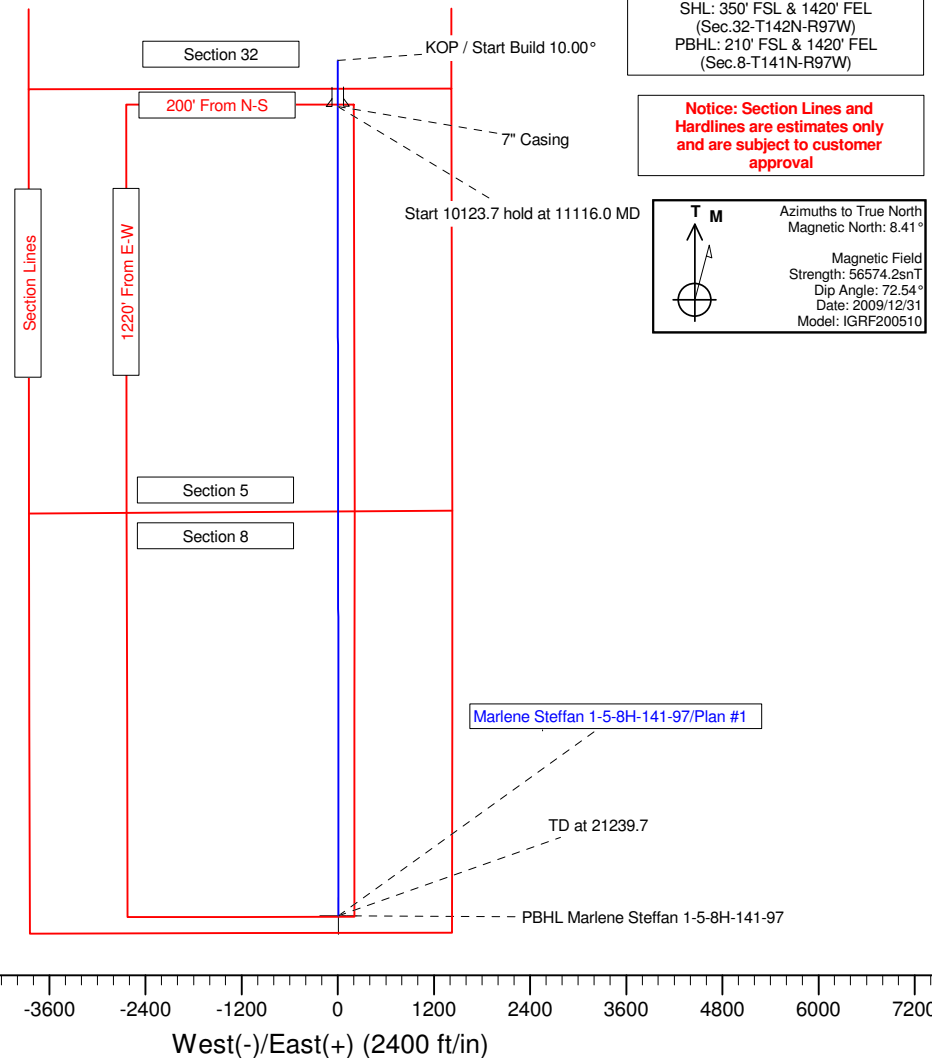
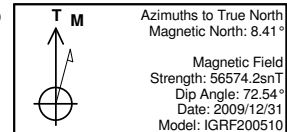
TVD	MD	Name	Size
10789.0	11116.0	7" Casing	7

South(-)/North(+) (2400 ft/in)

West(-)/East(+) (2400 ft/in)

SHL: 350' FSL & 1420' FEL
(Sec.32-T142N-R97W)
PBHL: 210' FSL & 1420' FEL
(Sec.8-T141N-R97W)

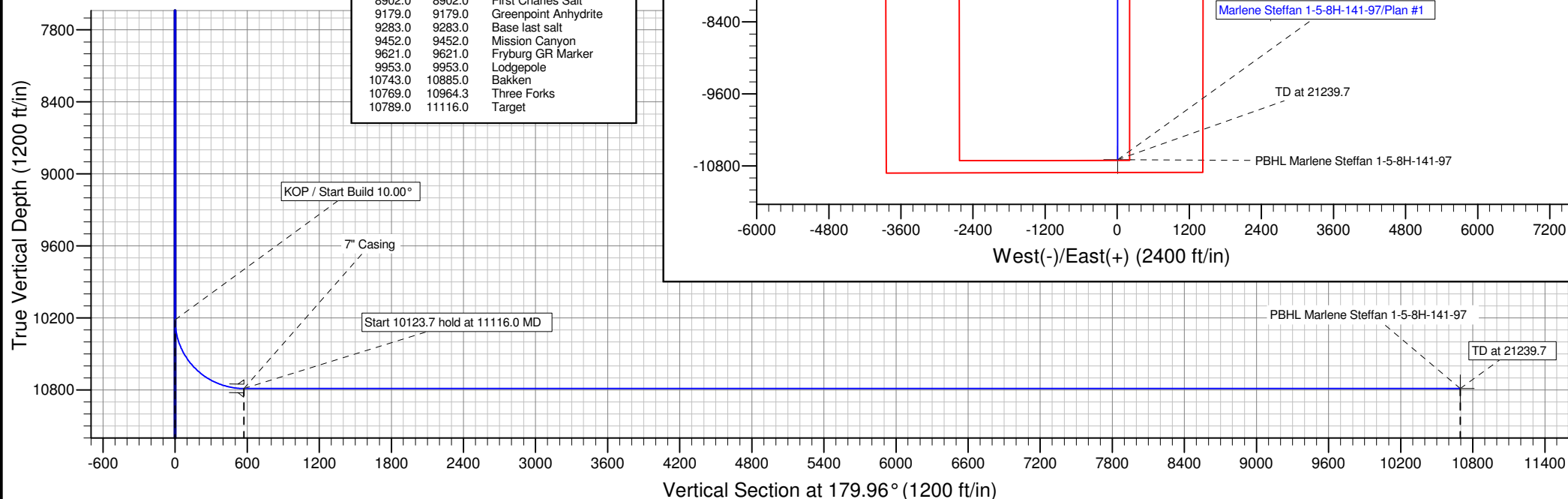
Notice: Section Lines and Hardlines are estimates only and are subject to customer approval



Marlene Steffan 1-5-8H-141-97/Plan #1

PBHL Marlene Steffan 1-5-8H-141-97

TD at 21239.7





Anschutz Exploration Corp.

Dunn Co., ND

Sec.32-T142N-R97W

Marlene Steffan 1-5-8H-141-97

Wellbore #1

Plan: Plan #1

Pathfinder Planning Report

07 April, 2011



A Schlumberger Company



Database: EDM 2003.16 Single User Db
Company: Anschutz Exploration Corp.
Project: Dunn Co., ND
Site: Sec.32-T142N-R97W
Well: Marlene Steffan 1-5-8H-141-97
Wellbore: Wellbore #1
Design: Plan #1

Local Co-ordinate Reference: Well Marlene Steffan 1-5-8H-141-97
TVD Reference: WELL @ 2653.0ft (Original Well Elev)
MD Reference: WELL @ 2653.0ft (Original Well Elev)
North Reference: True
Survey Calculation Method: Minimum Curvature

Project Dunn Co., ND

Map System: US State Plane 1983
Geo Datum: North American Datum 1983
Map Zone: North Dakota Southern Zone

System Datum: Mean Sea Level

Site Sec.32-T142N-R97W

Site Position: Northing: 521,070.13 ft Latitude: 47° 4' 6.150 N
From: Lat/Long Easting: 1,346,612.09 ft Longitude: 102° 59' 45.640 W
Position Uncertainty: 0.0 ft Slot Radius: " Grid Convergence: -1.82 °

Well Marlene Steffan 1-5-8H-141-97

Well Position +N/-S 0.0 ft Northing: 521,070.13 ft Latitude: 47° 4' 6.150 N
+E/-W 0.0 ft Easting: 1,346,612.09 ft Longitude: 102° 59' 45.640 W
Position Uncertainty 0.0 ft Wellhead Elevation: ft Ground Level: 2,620.0 ft

Wellbore Wellbore #1

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF200510	2009/12/31	8.41	72.54	56,574

Design 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	179.96

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	
10,216.0	0.00	0.00	10,216.0	0.0	0.0	0.00	0.00	0.00	0.00	
11,116.0	90.00	179.96	10,789.0	-573.0	0.4	10.00	10.00	0.00	179.96	PBHL Marlene Steffan
21,239.7	90.00	179.96	10,789.0	-10,696.7	7.4	0.00	0.00	0.00	0.00	PBHL Marlene Steffan



Database:	EDM 2003.16 Single User Db	Local Co-ordinate Reference:	Well Marlene Steffan 1-5-8H-141-97
Company:	Anschutz Exploration Corp.	TVD Reference:	WELL @ 2653.0ft (Original Well Elev)
Project:	Dunn Co., ND	MD Reference:	WELL @ 2653.0ft (Original Well Elev)
Site:	Sec.32-T142N-R97W	North Reference:	True
Well:	Marlene Steffan 1-5-8H-141-97	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
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
2,000.0	0.00	0.00	2,000.0	0.0	0.0	0.0	0.00	0.00	0.00
2,100.0	0.00	0.00	2,100.0	0.0	0.0	0.0	0.00	0.00	0.00
Pierre Shale									
2,153.0	0.00	0.00	2,153.0	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
4,700.0	0.00	0.00	4,700.0	0.0	0.0	0.0	0.00	0.00	0.00
Greenhorn									
4,789.0	0.00	0.00	4,789.0	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



Database: EDM 2003.16 Single User Db
Company: Anschutz Exploration Corp.
Project: Dunn Co., ND
Site: Sec.32-T142N-R97W
Well: Marlene Steffan 1-5-8H-141-97
Wellbore: Wellbore #1
Design: Plan #1

Local Co-ordinate Reference: Well Marlene Steffan 1-5-8H-141-97
TVD Reference: WELL @ 2653.0ft (Original Well Elev)
MD Reference: WELL @ 2653.0ft (Original Well Elev)
North Reference: True
Survey Calculation Method: Minimum Curvature

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)
4,900.0	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
5,100.0	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
Mowry									
5,251.0	0.00	0.00	5,251.0	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
5,500.0	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
Dakota									
5,630.0	0.00	0.00	5,630.0	0.0	0.0	0.0	0.00	0.00	0.00
5,700.0	0.00	0.00	5,700.0	0.0	0.0	0.0	0.00	0.00	0.00
5,800.0	0.00	0.00	5,800.0	0.0	0.0	0.0	0.00	0.00	0.00
5,900.0	0.00	0.00	5,900.0	0.0	0.0	0.0	0.00	0.00	0.00
6,000.0	0.00	0.00	6,000.0	0.0	0.0	0.0	0.00	0.00	0.00
6,100.0	0.00	0.00	6,100.0	0.0	0.0	0.0	0.00	0.00	0.00
6,200.0	0.00	0.00	6,200.0	0.0	0.0	0.0	0.00	0.00	0.00
6,300.0	0.00	0.00	6,300.0	0.0	0.0	0.0	0.00	0.00	0.00
6,400.0	0.00	0.00	6,400.0	0.0	0.0	0.0	0.00	0.00	0.00
6,500.0	0.00	0.00	6,500.0	0.0	0.0	0.0	0.00	0.00	0.00
Rierdon									
6,504.0	0.00	0.00	6,504.0	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
Dunham Salt									
6,896.0	0.00	0.00	6,896.0	0.0	0.0	0.0	0.00	0.00	0.00
6,900.0	0.00	0.00	6,900.0	0.0	0.0	0.0	0.00	0.00	0.00
Spearfish									
6,966.0	0.00	0.00	6,966.0	0.0	0.0	0.0	0.00	0.00	0.00
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
7,300.0	0.00	0.00	7,300.0	0.0	0.0	0.0	0.00	0.00	0.00
Minnekahta									
7,328.0	0.00	0.00	7,328.0	0.0	0.0	0.0	0.00	0.00	0.00
Opeche salt									
7,383.0	0.00	0.00	7,383.0	0.0	0.0	0.0	0.00	0.00	0.00
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
7,700.0	0.00	0.00	7,700.0	0.0	0.0	0.0	0.00	0.00	0.00
Minnelusa									
7,756.0	0.00	0.00	7,756.0	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
7,900.0	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
8,100.0	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
Tyler									
8,279.0	0.00	0.00	8,279.0	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



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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)
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
8,600.0	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
Kibbey Limestone									
8,747.0	0.00	0.00	8,747.0	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
Madison									
8,875.0	0.00	0.00	8,875.0	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
First Charles Salt									
8,902.0	0.00	0.00	8,902.0	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
Greenpoint Anhydrite									
9,179.0	0.00	0.00	9,179.0	0.0	0.0	0.0	0.00	0.00	0.00
9,200.0	0.00	0.00	9,200.0	0.0	0.0	0.0	0.00	0.00	0.00
Base last salt									
9,283.0	0.00	0.00	9,283.0	0.0	0.0	0.0	0.00	0.00	0.00
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
Mission Canyon									
9,452.0	0.00	0.00	9,452.0	0.0	0.0	0.0	0.00	0.00	0.00
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
Fryburg GR Marker									
9,621.0	0.00	0.00	9,621.0	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
Lodgepole									
9,953.0	0.00	0.00	9,953.0	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
10,100.0	0.00	0.00	10,100.0	0.0	0.0	0.0	0.00	0.00	0.00
10,200.0	0.00	0.00	10,200.0	0.0	0.0	0.0	0.00	0.00	0.00
KOP / Start Build 10.00°									
10,216.0	0.00	0.00	10,216.0	0.0	0.0	0.0	0.00	0.00	0.00
10,250.0	3.40	179.96	10,250.0	-1.0	0.0	1.0	10.00	10.00	0.00
10,300.0	8.40	179.96	10,299.7	-6.1	0.0	6.1	10.00	10.00	0.00
10,350.0	13.40	179.96	10,348.8	-15.6	0.0	15.6	10.00	10.00	0.00
10,400.0	18.40	179.96	10,396.9	-29.3	0.0	29.3	10.00	10.00	0.00
10,450.0	23.40	179.96	10,443.5	-47.1	0.0	47.1	10.00	10.00	0.00
10,500.0	28.40	179.96	10,488.5	-69.0	0.0	69.0	10.00	10.00	0.00
10,550.0	33.40	179.96	10,531.4	-94.6	0.1	94.6	10.00	10.00	0.00
10,600.0	38.40	179.96	10,571.9	-123.9	0.1	123.9	10.00	10.00	0.00
10,650.0	43.40	179.96	10,609.7	-156.7	0.1	156.7	10.00	10.00	0.00
10,700.0	48.40	179.96	10,644.5	-192.6	0.1	192.6	10.00	10.00	0.00
10,750.0	53.40	179.96	10,676.0	-231.3	0.2	231.3	10.00	10.00	0.00
10,800.0	58.40	179.96	10,704.0	-272.7	0.2	272.7	10.00	10.00	0.00
10,850.0	63.40	179.96	10,728.3	-316.4	0.2	316.4	10.00	10.00	0.00
Bakken									
10,885.0	66.90	179.96	10,743.0	-348.1	0.2	348.1	10.00	10.00	0.00



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North Reference: True
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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)
10,900.0	68.40	179.96	10,748.7	-362.0	0.3	362.0	10.00	10.00	0.00
10,950.0	73.40	179.96	10,765.1	-409.3	0.3	409.3	10.00	10.00	0.00
Three Forks									
10,964.3	74.83	179.96	10,769.0	-423.1	0.3	423.1	10.00	10.00	0.00
11,000.0	78.40	179.96	10,777.3	-457.7	0.3	457.7	10.00	10.00	0.00
11,050.0	83.40	179.96	10,785.2	-507.1	0.4	507.1	10.00	10.00	0.00
11,100.0	88.40	179.96	10,788.7	-557.0	0.4	557.0	10.00	10.00	0.00
Start 10123.7 hold at 11116.0 MD - Target - 7" Casing									
11,116.0	90.00	179.96	10,789.0	-573.0	0.4	573.0	10.00	10.00	0.00
11,200.0	90.00	179.96	10,789.0	-657.0	0.5	657.0	0.00	0.00	0.00
11,300.0	90.00	179.96	10,789.0	-757.0	0.5	757.0	0.00	0.00	0.00
11,400.0	90.00	179.96	10,789.0	-857.0	0.6	857.0	0.00	0.00	0.00
11,500.0	90.00	179.96	10,789.0	-957.0	0.7	957.0	0.00	0.00	0.00
11,600.0	90.00	179.96	10,789.0	-1,057.0	0.7	1,057.0	0.00	0.00	0.00
11,700.0	90.00	179.96	10,789.0	-1,157.0	0.8	1,157.0	0.00	0.00	0.00
11,800.0	90.00	179.96	10,789.0	-1,257.0	0.9	1,257.0	0.00	0.00	0.00
11,900.0	90.00	179.96	10,789.0	-1,357.0	0.9	1,357.0	0.00	0.00	0.00
12,000.0	90.00	179.96	10,789.0	-1,457.0	1.0	1,457.0	0.00	0.00	0.00
12,100.0	90.00	179.96	10,789.0	-1,557.0	1.1	1,557.0	0.00	0.00	0.00
12,200.0	90.00	179.96	10,789.0	-1,657.0	1.1	1,657.0	0.00	0.00	0.00
12,300.0	90.00	179.96	10,789.0	-1,757.0	1.2	1,757.0	0.00	0.00	0.00
12,400.0	90.00	179.96	10,789.0	-1,857.0	1.3	1,857.0	0.00	0.00	0.00
12,500.0	90.00	179.96	10,789.0	-1,957.0	1.4	1,957.0	0.00	0.00	0.00
12,600.0	90.00	179.96	10,789.0	-2,057.0	1.4	2,057.0	0.00	0.00	0.00
12,700.0	90.00	179.96	10,789.0	-2,157.0	1.5	2,157.0	0.00	0.00	0.00
12,800.0	90.00	179.96	10,789.0	-2,257.0	1.6	2,257.0	0.00	0.00	0.00
12,900.0	90.00	179.96	10,789.0	-2,357.0	1.6	2,357.0	0.00	0.00	0.00
13,000.0	90.00	179.96	10,789.0	-2,457.0	1.7	2,457.0	0.00	0.00	0.00
13,100.0	90.00	179.96	10,789.0	-2,557.0	1.8	2,557.0	0.00	0.00	0.00
13,200.0	90.00	179.96	10,789.0	-2,657.0	1.8	2,657.0	0.00	0.00	0.00
13,300.0	90.00	179.96	10,789.0	-2,757.0	1.9	2,757.0	0.00	0.00	0.00
13,400.0	90.00	179.96	10,789.0	-2,857.0	2.0	2,857.0	0.00	0.00	0.00
13,500.0	90.00	179.96	10,789.0	-2,957.0	2.0	2,957.0	0.00	0.00	0.00
13,600.0	90.00	179.96	10,789.0	-3,057.0	2.1	3,057.0	0.00	0.00	0.00
13,700.0	90.00	179.96	10,789.0	-3,157.0	2.2	3,157.0	0.00	0.00	0.00
13,800.0	90.00	179.96	10,789.0	-3,257.0	2.3	3,257.0	0.00	0.00	0.00
13,900.0	90.00	179.96	10,789.0	-3,357.0	2.3	3,357.0	0.00	0.00	0.00
14,000.0	90.00	179.96	10,789.0	-3,457.0	2.4	3,457.0	0.00	0.00	0.00
14,100.0	90.00	179.96	10,789.0	-3,557.0	2.5	3,557.0	0.00	0.00	0.00
14,200.0	90.00	179.96	10,789.0	-3,657.0	2.5	3,657.0	0.00	0.00	0.00
14,300.0	90.00	179.96	10,789.0	-3,757.0	2.6	3,757.0	0.00	0.00	0.00
14,400.0	90.00	179.96	10,789.0	-3,857.0	2.7	3,857.0	0.00	0.00	0.00
14,500.0	90.00	179.96	10,789.0	-3,957.0	2.7	3,957.0	0.00	0.00	0.00
14,600.0	90.00	179.96	10,789.0	-4,057.0	2.8	4,057.0	0.00	0.00	0.00
14,700.0	90.00	179.96	10,789.0	-4,157.0	2.9	4,157.0	0.00	0.00	0.00
14,800.0	90.00	179.96	10,789.0	-4,257.0	2.9	4,257.0	0.00	0.00	0.00
14,900.0	90.00	179.96	10,789.0	-4,357.0	3.0	4,357.0	0.00	0.00	0.00
15,000.0	90.00	179.96	10,789.0	-4,457.0	3.1	4,457.0	0.00	0.00	0.00
15,100.0	90.00	179.96	10,789.0	-4,557.0	3.2	4,557.0	0.00	0.00	0.00
15,200.0	90.00	179.96	10,789.0	-4,657.0	3.2	4,657.0	0.00	0.00	0.00
15,300.0	90.00	179.96	10,789.0	-4,757.0	3.3	4,757.0	0.00	0.00	0.00
15,400.0	90.00	179.96	10,789.0	-4,857.0	3.4	4,857.0	0.00	0.00	0.00
15,500.0	90.00	179.96	10,789.0	-4,957.0	3.4	4,957.0	0.00	0.00	0.00



Database: EDM 2003.16 Single User Db
Company: Anschutz Exploration Corp.
Project: Dunn Co., ND
Site: Sec.32-T142N-R97W
Well: Marlene Steffan 1-5-8H-141-97
Wellbore: Wellbore #1
Design: Plan #1

Local Co-ordinate Reference: Well Marlene Steffan 1-5-8H-141-97
TVD Reference: WELL @ 2653.0ft (Original Well Elev)
MD Reference: WELL @ 2653.0ft (Original Well Elev)
North Reference: True
Survey Calculation Method: Minimum Curvature

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)
15,600.0	90.00	179.96	10,789.0	-5,057.0	3.5	5,057.0	0.00	0.00	0.00
15,700.0	90.00	179.96	10,789.0	-5,157.0	3.6	5,157.0	0.00	0.00	0.00
15,800.0	90.00	179.96	10,789.0	-5,257.0	3.6	5,257.0	0.00	0.00	0.00
15,900.0	90.00	179.96	10,789.0	-5,357.0	3.7	5,357.0	0.00	0.00	0.00
16,000.0	90.00	179.96	10,789.0	-5,457.0	3.8	5,457.0	0.00	0.00	0.00
16,100.0	90.00	179.96	10,789.0	-5,557.0	3.8	5,557.0	0.00	0.00	0.00
16,200.0	90.00	179.96	10,789.0	-5,657.0	3.9	5,657.0	0.00	0.00	0.00
16,300.0	90.00	179.96	10,789.0	-5,757.0	4.0	5,757.0	0.00	0.00	0.00
16,400.0	90.00	179.96	10,789.0	-5,857.0	4.1	5,857.0	0.00	0.00	0.00
16,500.0	90.00	179.96	10,789.0	-5,957.0	4.1	5,957.0	0.00	0.00	0.00
16,600.0	90.00	179.96	10,789.0	-6,057.0	4.2	6,057.0	0.00	0.00	0.00
16,700.0	90.00	179.96	10,789.0	-6,157.0	4.3	6,157.0	0.00	0.00	0.00
16,800.0	90.00	179.96	10,789.0	-6,257.0	4.3	6,257.0	0.00	0.00	0.00
16,900.0	90.00	179.96	10,789.0	-6,357.0	4.4	6,357.0	0.00	0.00	0.00
17,000.0	90.00	179.96	10,789.0	-6,457.0	4.5	6,457.0	0.00	0.00	0.00
17,100.0	90.00	179.96	10,789.0	-6,557.0	4.5	6,557.0	0.00	0.00	0.00
17,200.0	90.00	179.96	10,789.0	-6,657.0	4.6	6,657.0	0.00	0.00	0.00
17,300.0	90.00	179.96	10,789.0	-6,757.0	4.7	6,757.0	0.00	0.00	0.00
17,400.0	90.00	179.96	10,789.0	-6,857.0	4.7	6,857.0	0.00	0.00	0.00
17,500.0	90.00	179.96	10,789.0	-6,957.0	4.8	6,957.0	0.00	0.00	0.00
17,600.0	90.00	179.96	10,789.0	-7,057.0	4.9	7,057.0	0.00	0.00	0.00
17,700.0	90.00	179.96	10,789.0	-7,157.0	5.0	7,157.0	0.00	0.00	0.00
17,800.0	90.00	179.96	10,789.0	-7,257.0	5.0	7,257.0	0.00	0.00	0.00
17,900.0	90.00	179.96	10,789.0	-7,357.0	5.1	7,357.0	0.00	0.00	0.00
18,000.0	90.00	179.96	10,789.0	-7,457.0	5.2	7,457.0	0.00	0.00	0.00
18,100.0	90.00	179.96	10,789.0	-7,557.0	5.2	7,557.0	0.00	0.00	0.00
18,200.0	90.00	179.96	10,789.0	-7,657.0	5.3	7,657.0	0.00	0.00	0.00
18,300.0	90.00	179.96	10,789.0	-7,757.0	5.4	7,757.0	0.00	0.00	0.00
18,400.0	90.00	179.96	10,789.0	-7,857.0	5.4	7,857.0	0.00	0.00	0.00
18,500.0	90.00	179.96	10,789.0	-7,957.0	5.5	7,957.0	0.00	0.00	0.00
18,600.0	90.00	179.96	10,789.0	-8,057.0	5.6	8,057.0	0.00	0.00	0.00
18,700.0	90.00	179.96	10,789.0	-8,157.0	5.6	8,157.0	0.00	0.00	0.00
18,800.0	90.00	179.96	10,789.0	-8,257.0	5.7	8,257.0	0.00	0.00	0.00
18,900.0	90.00	179.96	10,789.0	-8,357.0	5.8	8,357.0	0.00	0.00	0.00
19,000.0	90.00	179.96	10,789.0	-8,457.0	5.9	8,457.0	0.00	0.00	0.00
19,100.0	90.00	179.96	10,789.0	-8,557.0	5.9	8,557.0	0.00	0.00	0.00
19,200.0	90.00	179.96	10,789.0	-8,657.0	6.0	8,657.0	0.00	0.00	0.00
19,300.0	90.00	179.96	10,789.0	-8,757.0	6.1	8,757.0	0.00	0.00	0.00
19,400.0	90.00	179.96	10,789.0	-8,857.0	6.1	8,857.0	0.00	0.00	0.00
19,500.0	90.00	179.96	10,789.0	-8,957.0	6.2	8,957.0	0.00	0.00	0.00
19,600.0	90.00	179.96	10,789.0	-9,057.0	6.3	9,057.0	0.00	0.00	0.00
19,700.0	90.00	179.96	10,789.0	-9,157.0	6.3	9,157.0	0.00	0.00	0.00
19,800.0	90.00	179.96	10,789.0	-9,257.0	6.4	9,257.0	0.00	0.00	0.00
19,900.0	90.00	179.96	10,789.0	-9,357.0	6.5	9,357.0	0.00	0.00	0.00
20,000.0	90.00	179.96	10,789.0	-9,457.0	6.5	9,457.0	0.00	0.00	0.00
20,100.0	90.00	179.96	10,789.0	-9,557.0	6.6	9,557.0	0.00	0.00	0.00
20,200.0	90.00	179.96	10,789.0	-9,657.0	6.7	9,657.0	0.00	0.00	0.00
20,300.0	90.00	179.96	10,789.0	-9,757.0	6.7	9,757.0	0.00	0.00	0.00
20,400.0	90.00	179.96	10,789.0	-9,857.0	6.8	9,857.0	0.00	0.00	0.00
20,500.0	90.00	179.96	10,789.0	-9,957.0	6.9	9,957.0	0.00	0.00	0.00
20,600.0	90.00	179.96	10,789.0	-10,057.0	7.0	10,057.0	0.00	0.00	0.00
20,700.0	90.00	179.96	10,789.0	-10,157.0	7.0	10,157.0	0.00	0.00	0.00
20,800.0	90.00	179.96	10,789.0	-10,257.0	7.1	10,257.0	0.00	0.00	0.00



Database: EDM 2003.16 Single User Db
Company: Anschutz Exploration Corp.
Project: Dunn Co., ND
Site: Sec.32-T142N-R97W
Well: Marlene Steffan 1-5-8H-141-97
Wellbore: Wellbore #1
Design: Plan #1

Local Co-ordinate Reference: Well Marlene Steffan 1-5-8H-141-97
TVD Reference: WELL @ 2653.0ft (Original Well Elev)
MD Reference: WELL @ 2653.0ft (Original Well Elev)
North Reference: True
Survey Calculation Method: Minimum Curvature

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)
20,900.0	90.00	179.96	10,789.0	-10,357.0	7.2	10,357.0	0.00	0.00	0.00
21,000.0	90.00	179.96	10,789.0	-10,457.0	7.2	10,457.0	0.00	0.00	0.00
21,100.0	90.00	179.96	10,789.0	-10,557.0	7.3	10,557.0	0.00	0.00	0.00
21,200.0	90.00	179.96	10,789.0	-10,657.0	7.4	10,657.0	0.00	0.00	0.00
TD at 21239.7 - PBHL Marlene Steffan 1-5-8H-141-97 - PBHL Marlene Steffan 1-5-8H-141-97									
21,239.7	90.00	179.96	10,789.0	-10,696.7	7.4	10,696.7	0.00	0.00	0.00

Targets**Target Name**

- hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
PBHL Marlene Steffan 1 - plan hits target center - Point	0.00	0.00	10,789.0	-10,696.7	7.4	510,378.60	1,346,279.67	47° 2' 20.566 N	102° 59' 45.533 W

Casing Points

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
11,116.0	10,789.0	7" Casing	7	8-3/4



Database:	EDM 2003.16 Single User Db	Local Co-ordinate Reference:	Well Marlene Steffan 1-5-8H-141-97
Company:	Anschutz Exploration Corp.	TVD Reference:	WELL @ 2653.0ft (Original Well Elev)
Project:	Dunn Co., ND	MD Reference:	WELL @ 2653.0ft (Original Well Elev)
Site:	Sec.32-T142N-R97W	North Reference:	True
Well:	Marlene Steffan 1-5-8H-141-97	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1		

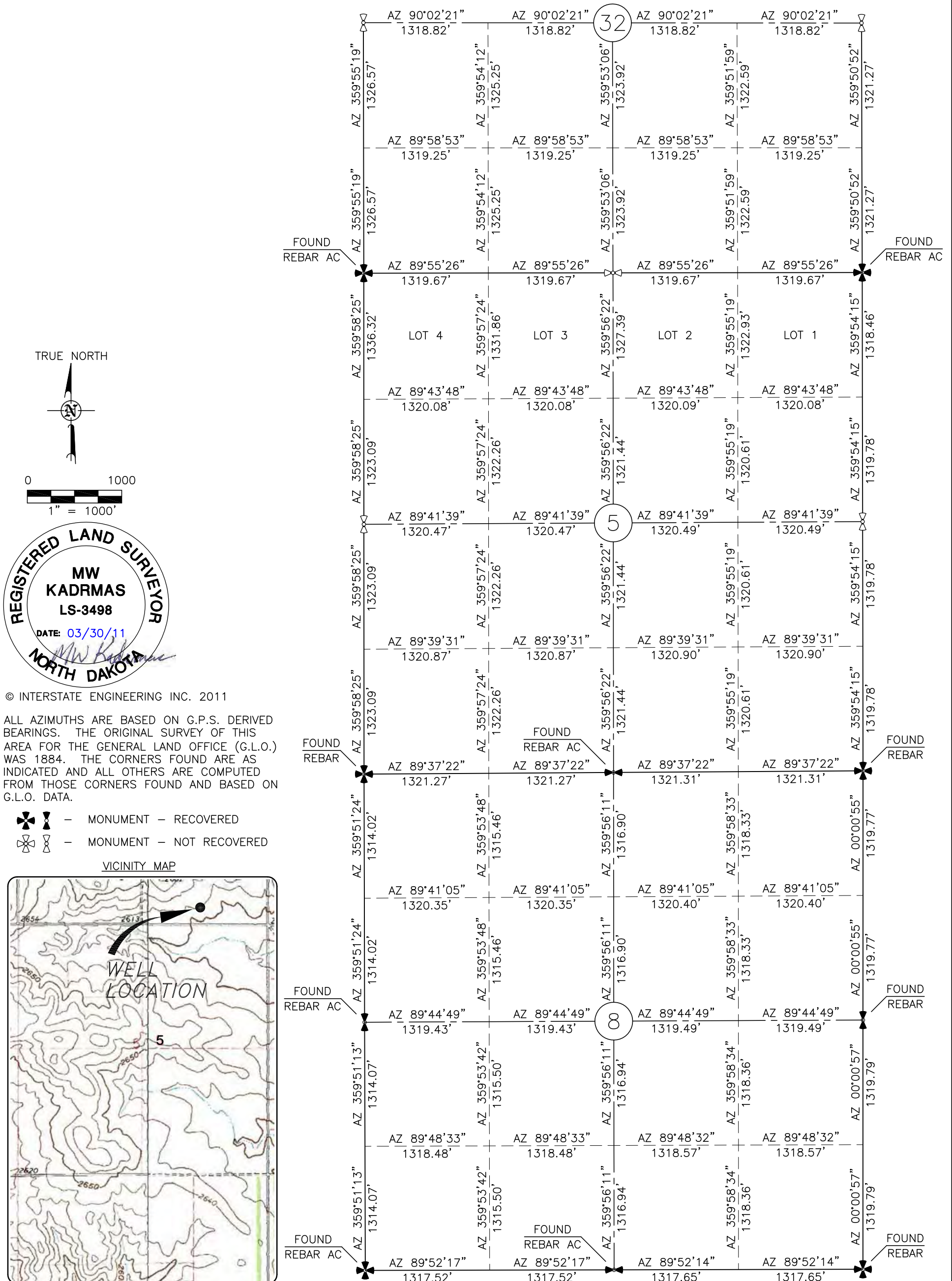
Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
2,153.0	2,153.0	Pierre Shale		0.00	
4,789.0	4,789.0	Greenhorn		0.00	
5,251.0	5,251.0	Mowry		0.00	
5,630.0	5,630.0	Dakota		0.00	
6,504.0	6,504.0	Rierdon		0.00	
6,896.0	6,896.0	Dunham Salt		0.00	
6,966.0	6,966.0	Spearfish		0.00	
7,328.0	7,328.0	Minnekahta		0.00	
7,383.0	7,383.0	Opeche salt		0.00	
7,756.0	7,756.0	Minnelusa		0.00	
8,279.0	8,279.0	Tyler		0.00	
8,747.0	8,747.0	Kibbey Limestone		0.00	
8,875.0	8,875.0	Madison		0.00	
8,902.0	8,902.0	First Charles Salt		0.00	
9,179.0	9,179.0	Greenpoint Anhydrite		0.00	
9,283.0	9,283.0	Base last salt		0.00	
9,452.0	9,452.0	Mission Canyon		0.00	
9,621.0	9,621.0	Fryburg GR Marker		0.00	
9,953.0	9,953.0	Lodgepole		0.00	
10,885.0	10,743.0	Bakken		0.00	
10,964.3	10,769.0	Three Forks		0.00	
11,116.0	10,789.0	Target		0.00	

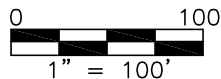
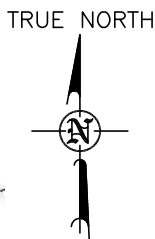
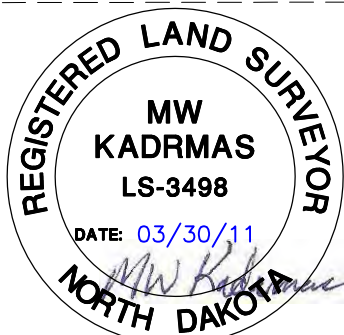
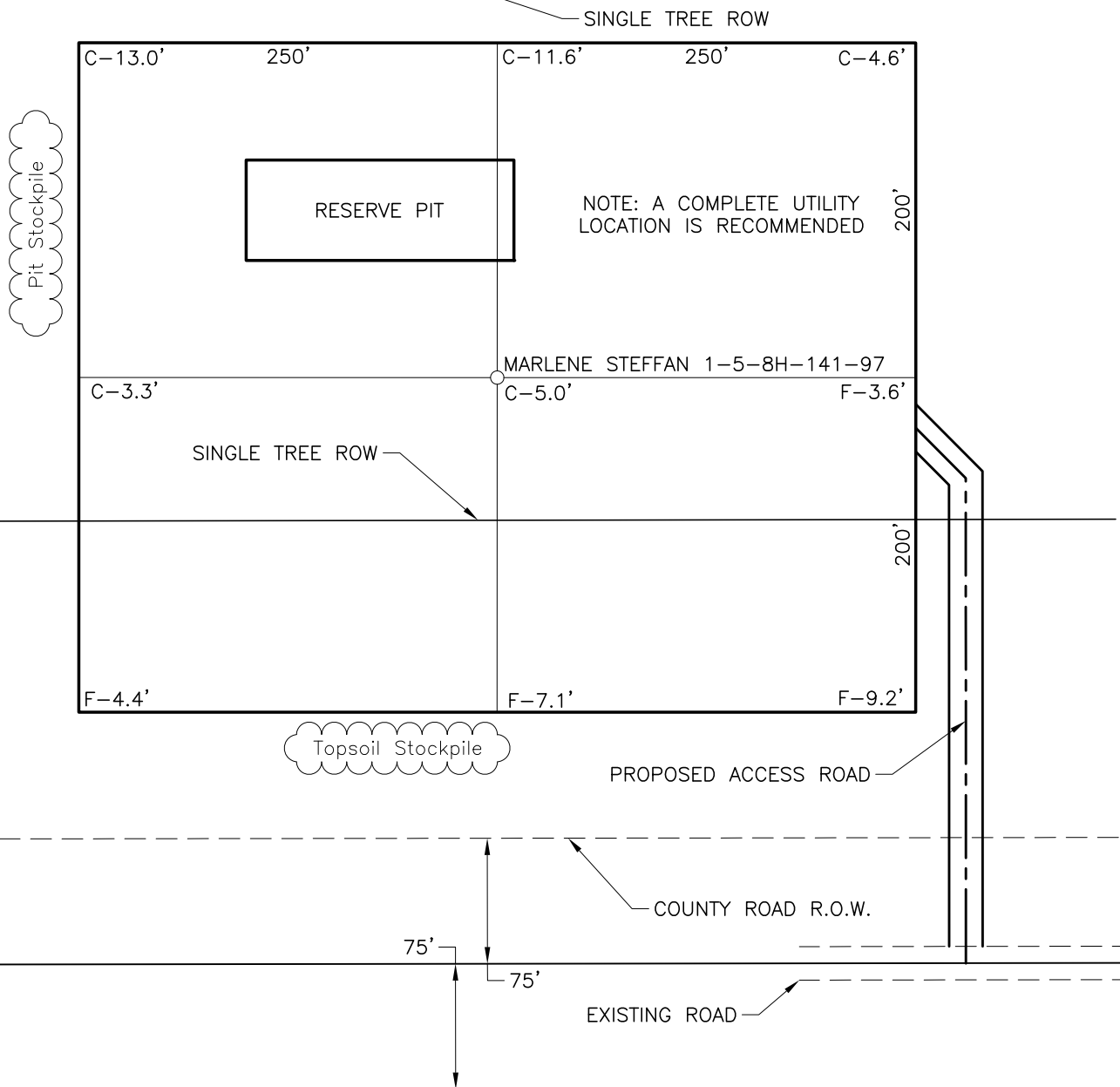
Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
10,216.0	10,216.0	0.0	0.0	KOP / Start Build 10.00°
11,116.0	10,789.0	-573.0	0.4	Start 10123.7 hold at 11116.0 MD
21,239.7	10,789.0	-10,696.7	7.4	TD at 21239.7

ANSCHUTZ EXPLORATION COMPANY
555 17TH STREET, SUITE 2400, DENVER, CO 80202
"MARLENE STEFFAN 1-5-8H-141-97"
350 FEET FROM SOUTH LINE AND 1420 FEET FROM EAST LINE
SEC 32, T142N, R97W, 5TH P.M.
DUNN COUNTY, NORTH DAKOTA



DRILL PAD LAYOUT
 ANSCHUTZ EXPLORATION COMPANY
 555 17TH STREET, SUITE 2400, DENVER, CO 80202
 "MARLENE STEFFAN 1-5-8H-141-97"
 350 FEET FROM SOUTH LINE AND 1420 FEET FROM EAST LINE
 SEC 32, T142N, R97W, 5TH P.M.
 DUNN COUNTY, NORTH DAKOTA



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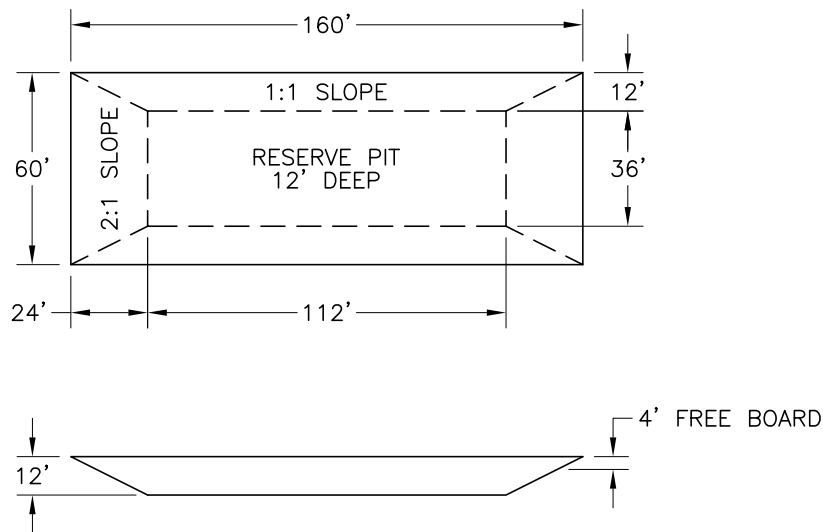
SITE QUANTITIES

ANSCHUTZ EXPLORATION COMPANY
555 17TH STREET, SUITE 2400, DENVER, CO 80202
"MARLENE STEFFAN 1-5-8H-141-97"
350 FEET FROM SOUTH LINE AND 1420 FEET FROM EAST LINE
SEC 32, T142N, R97W, 5TH P.M.
DUNN COUNTY, NORTH DAKOTA

WELL SITE ELEVATION	2620.0
WELL PAD ELEVATION	2615.0
EXCAVATION	28115
PLUS PIT	<u>3150</u>
	31265
EMBANKMENT	12733
PLUS SHRINKAGE (30%)	<u>3820</u>
	16553
STOCKPILE PIT	3150
STOCKPILE TOP SOIL (6")	3711
STOCKPILE FROM EXCESS EXCAVATION	7851
DISTURBED AREA FROM PAD	4.60 ACRES

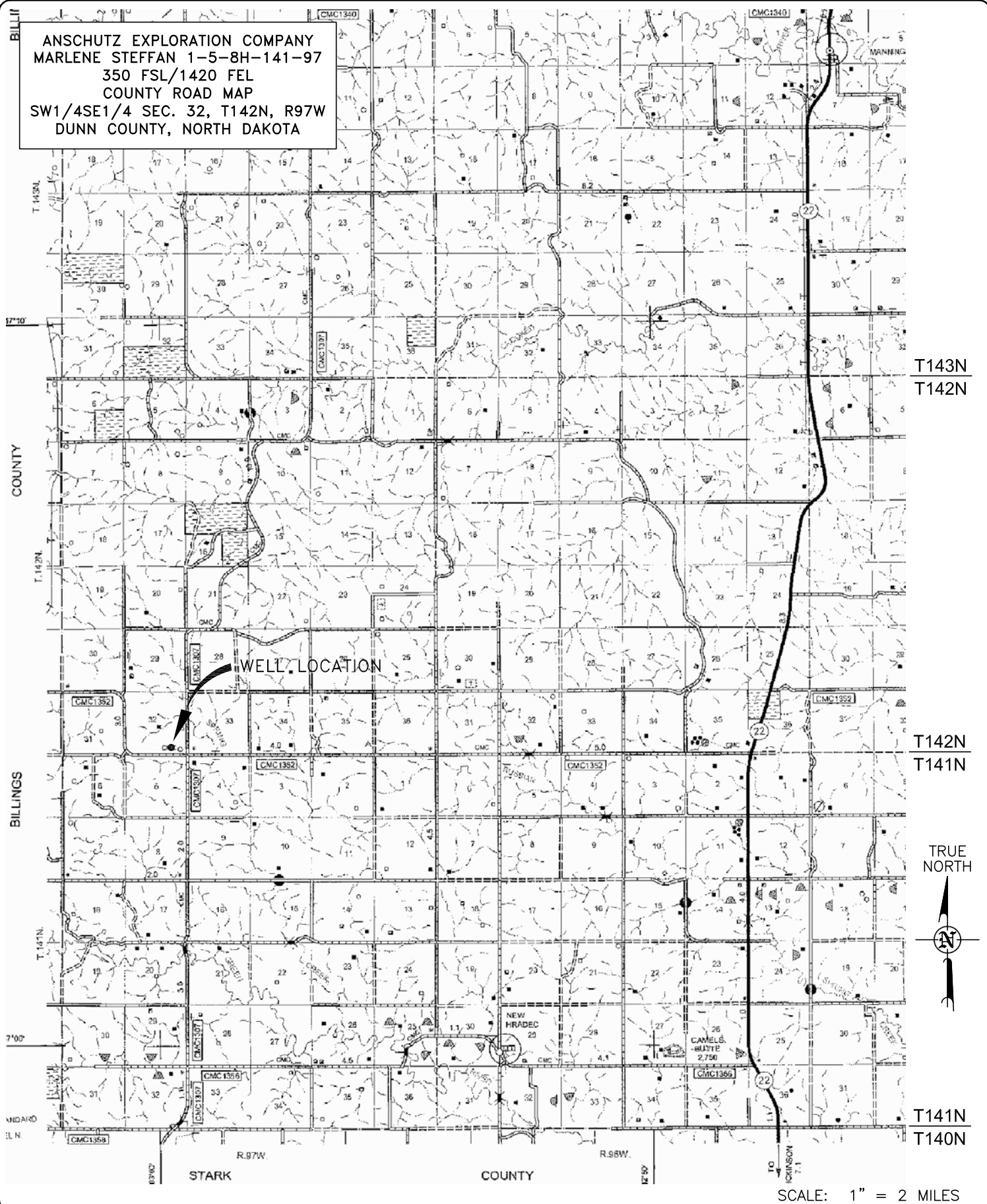
NOTE: ALL QUANTITIES ARE IN CUBIC YARDS (UNLESS OTHERWISE NOTED)
CUT END SLOPES AT 1:1
FILL END SLOPES AT 1.5:1

WELL SITE LOCATION: 350' FSL, 1420' FEL



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ANSCHUTZ EXPLORATION COMPANY
MARLENE STEFFAN 1-5-8H-141-97
350 FSL/1420 FEL
COUNTY ROAD MAP
SW1/4SE1/4 SEC. 32, T142N, R97W
DUNN COUNTY, NORTH DAKOTA



SHEET
6
OF
6



interstate engineering, inc.
Engineering - Surveying - Planning
P.O. Box 266 Belfield, North Dakota 701-575-2247

COUNTY ROAD MAP
SEC 32, T142N, R97W, 5TH P.M.
DUNN COUNTY, NORTH DAKOTA
Drawn By J.J.W. Project No. B11-08-012
Checked By M.W.K. Date FEB. 2011

Revis. No.	Date	By	Description
1	3/30/11	J.J.W.	WELL MOVE

ANSCHUTZ EXPLORATION COMPANY
MARLENE STEFFAN 1-5-8H-141-97
350 FSL/1420 FEL
TOPOGRAPHIC MAP
SW1/4SE1/4 SEC. 32, T142N, R97W
DUNN COUNTY, NORTH DAKOTA

WELL
LOCATION

TRUE
NORTH



1" = 2000'

SHEET
5
OF
6



interstate engineering, inc.

Engineering - Surveying - Planning

P.O. Box 266 Belfield, North Dakota 701-575-2247

TOPOGRAPHIC MAP

SEC 32, T142N, R97W, 5TH P.M.

DUNN COUNTY, NORTH DAKOTA

Drawn By J.J.W.

Checked By M.W.K.

Project No. B11-08-012

Date FEB. 2011

Revis No.	Date	By	Description
1	3/30/11	J.J.W.	WELL MOVE

TRUE OIL LLC
HIBL
23-7
NE NE SW
T141N R97W S7

PUMA PETROLEUM CORP
HECKER
1-15A
SE NE
T141N R97W S15

