

State of New Mexico
Energy, Minerals and Natural Resources Department

Susana Martinez
Governor

Ken McQueen
Cabinet Secretary

Matthias Sayer
Deputy Cabinet Secretary

Heather Riley, Division Director
Oil Conservation Division



New Mexico Oil Conservation Division approval and conditions listed below are made in accordance with OCD Rule 19.15.7.11 and are in addition to the actions approved by BLM on the following 3160-5 form.
Operator Signature Date: Original APD 8/2/2017 **Sundry Date 3/23/2018**

API WELL #	Well Name	Well #	Operator Name	Type	Stat	County	Surf_Owner	UL	Sec	Twp	N/S	Rng	W/E
30-045-35851-00-00	NORTHEAST BLANCO UNIT 605 COM	001H	BP AMERICA PRODUCTION COMPANY	G	N	San Juan	F	P	11	31	N	7	W

Conditions of Approval:

(See the below checked and handwritten conditions)

- ✓ Notify Aztec OCD 24hrs prior to casing & cement. **Run CBL if cement does not circulate**
- ✓ Hold C-104 for directional survey & "As Drilled" Plat
- ✓ Hold C-104 for NSL, NSP, DHC,
- ☐ Spacing rule violation. Operator must follow up with change of status notification on other well to be shut in or abandoned
- ✓ Regarding the use of a pit, closed loop system or below grade tank, the operator must comply with the following as applicable:
 - ✓ A pit requires a complete C-144 be submitted and approved prior to the construction or use of the pit, pursuant to 19.15.17.8.A
 - ✓ A closed loop system requires notification prior to use, pursuant to 19.15.17.9.A
 - ✓ A below grade tank requires a registration be filed prior to the construction or use of the below grade tank, pursuant to 19.15.17.8.C
- ✓ Once the well is spud, to prevent ground water contamination through whole or partial conduits from the surface, the operator shall drill without interruption through the fresh water zone or zones and shall immediately set in cement the water protection string
- ✓ Submit Gas Capture Plan form prior to spudding or initiating recompletions operations.
- ✓ Regarding Hydraulic Fracturing, review EPA Underground Injection Control Guidance 84

April 9, 2018

Page 2

- ✓ Oil base muds are not to be used until fresh water zones are cased and cemented providing isolation from the oil or diesel. This includes synthetic oils. Oil based mud, drilling fluids and solids must be contained in a steel closed loop system.
- ✓ Well-bore communication is regulated under 19.15.29 NMAC. This requires well-bore Communication to be reported in accordance with 19.15.29.8.
- ✓ Comply with current regulations at time of spud
Prior to production operator needs to be in compliance with RULE 19.15.5.9
- ✓ Notify Aztec OCD 24hrs prior to casing & cement.
- ✓ Notify the OCD Engineering Bureau of the change in setbacks to see if an amended NSL will be necessary prior to C-104 approval.
- ✓ Adhere to any other previously issued conditions.



NMOCD Approved by Signature

4/5/18

Date

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENTFORM APPROVED
OMB NO. 1004-0137
Expires: January 31, 2018**SUNDRY NOTICES AND REPORTS ON WELLS**
*Do not use this form for proposals to drill or to re-enter an abandoned well. Use form 3160-3 (APD) for such proposals.*5. Lease Serial No.
FEE

6. If Indian, Allottee or Tribe Name

SUBMIT IN TRIPLICATE - Other instructions on page 27. If Unit or CA/Agreement, Name and/or No.
NMNM138042

1. Type of Well

☐ Oil Well ☒ Gas Well ☐ Other8. Well Name and No.
NEBU 605 COM 1H

2. Name of Operator

BP AMERICA PRODUCTION COMPANY

Contact: TOYA COLVIN

Email: Toya.Colvin@bp.com

9. API Well No.

30-045-35851-00-X1

3a. Address

501 WESTLAKE PARK BLVD. THREE ELDRIDGE PLACE
HOUSTON, TX 77079

3b. Phone No. (include area code)

Ph: 281.892.5369

10. Field and Pool or Exploratory Area
BASIN MANCOS

4. Location of Well (Footage, Sec., T., R., M., or Survey Description)

Sec 11 T31N R7W SESE 440FSL 805FEL
36.907990 N Lat, 107.534065 W Lon

11. County or Parish, State

SAN JUAN COUNTY, NM

12. CHECK THE APPROPRIATE BOX(ES) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

TYPE OF SUBMISSION	TYPE OF ACTION			
☒ Notice of Intent	☐ Acidize	☐ Deepen	☐ Production (Start/Resume)	☐ Water Shut-Off
☐ Subsequent Report	☐ Alter Casing	☐ Hydraulic Fracturing	☐ Reclamation	☐ Well Integrity
☐ Final Abandonment Notice	☐ Casing Repair	☐ New Construction	☐ Recomplete	☒ Other
	☐ Change Plans	☐ Plug and Abandon	☐ Temporarily Abandon	Change to Original A
	☐ Convert to Injection	☐ Plug Back	☐ Water Disposal	PD

13. Describe Proposed or Completed Operation: Clearly state all pertinent details, including estimated starting date of any proposed work and approximate duration thereof. If the proposal is to deepen directionally or recompleat horizontally, give subsurface locations and measured and true vertical depths of all pertinent markers and zones. Attach the Bond under which the work will be performed or provide the Bond No. on file with BLM/BIA. Required subsequent reports must be filed within 30 days following completion of the involved operations. If the operation results in a multiple completion or recompleat in a new interval, a Form 3160-4 must be filed once testing has been completed. Final Abandonment Notices must be filed only after all requirements, including reclamation, have been completed and the operator has determined that the site is ready for final inspection.

During operations the 5 1/2" Casing was filled with cement, therefore BP respectfully requests to sidetrack the subject well.

Please see the attached updated drill plans, directional plans, and plat describing our procedure for sidetrack.

NMOCD

APR 05 2018

DISTRICT III

14. I hereby certify that the foregoing is true and correct.

Electronic Submission #409083 verified by the BLM Well Information System
For BP AMERICA PRODUCTION COMPANY, sent to the Farmington
Committed to AFMSS for processing by JACK SAVAGE on 03/27/2018 (18JWS0110SE)

Name (Printed/Typed) TOYA COLVIN

Title REGULATORY ANALYST

Signature (Electronic Submission)

Date 03/23/2018

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved By JACK SAVAGE

Title PETROLEUM ENGINEER

Date 03/27/2018

Conditions of approval, if any, are attached. Approval of this notice does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.

Office Farmington

Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

(Instructions on page 2)

**** BLM REVISED ** BLM REVISED ** BLM REVISED ** BLM REVISED ** BLM REVISED ****

NMOCD

District I
1625 N. French Dr., Hobbs, NM 88240
Phone: (575) 393-6161 Fax: (575) 393-0720

District II
811 S. First St., Artesia, NM 88210
Phone: (575) 748-1283 Fax: (575) 748-9720

District III
1000 Rio Brazos Road, Aztec, NM 87410
Phone: (505) 334-6178 Fax: (505) 334-6170

District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505
Phone: (505) 476-3460 Fax: (505) 476-3462

State of New Mexico
Energy, Minerals & Natural Resources Department
OIL CONSERVATION DIVISION
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-102
Revised August 1, 2011
Submit one copy to appropriate
District Office

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

¹ API Number 30-045-35851	² Pool Code 97232	³ Pool Name Basin Mancos Gas
⁴ Property Code 319806	⁵ Property Name Northeast Blanco Unit 605 Com	⁶ Well Number 1H
⁷ OGRID No. 000778	⁸ Operator Name BP America Production Company	⁹ Elevation 6471

" Surface Location

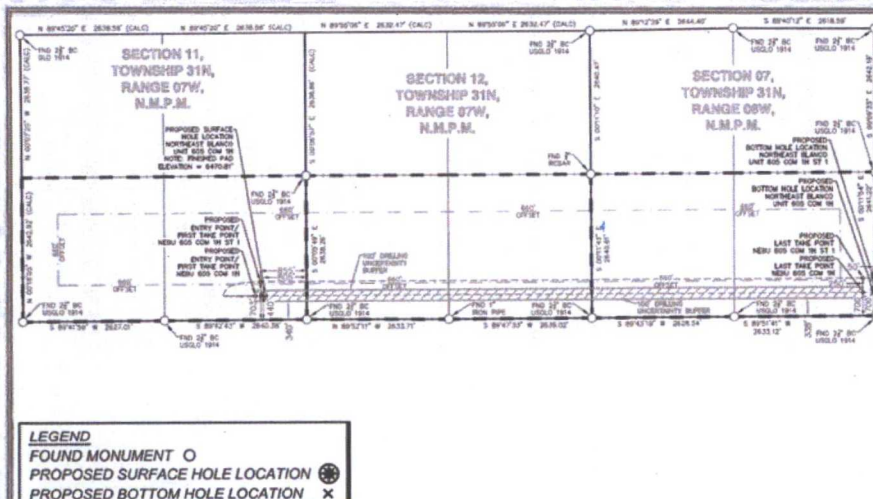
UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
P	11	31N	07W		440	South	805	East	San Juan

" Bottom Hole Location If Different From Surface

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
P	07	31N	06W		700	South	50	East	San Juan

¹² Dedicated Acres 960.00 - S/2 - SEC. 11, T31N, R07W S/2 - SEC. 12, T31N, R07W S/2 - SEC. 07, T31N, R06W	¹³ Joint or Infill	¹⁴ Consolidation Code	¹⁵ Order No.
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No allowable will be assigned to this completion until all interests have been consolidated or a non-standard unit has been approved by the division.



LEGEND
FOUND MONUMENT O
PROPOSED SURFACE HOLE LOCATION *
PROPOSED BOTTOM HOLE LOCATION X

NEBU 605 COM 1H	NMWZ NAD'83	NAD'83	TIES
PROPOSED SURFACE HOLE LOCATION (SHL)	N (Y) = 2,149,972.24' E (X) = 2,810,585.35'	LAT. = 36.90798961°N LON. = 107.53406636°W	FSL = 440' FEL = 805'
PROPOSED ENTRY POINT (EP)/FIRST TAKE POINT (FTP)	N (Y) = 2,149,973.34' E (X) = 2,810,438.71'	LAT. = 36.90799390°N LON. = 107.53456792°W	FSL = 441' FEL = 952'
PROPOSED LAST TAKE POINT (LTP)	N (Y) = 2,149,996.79' E (X) = 2,821,674.14'	LAT. = 36.90795545°N LON. = 107.49613808°W	FSL = 438' FEL = 250'
PROPOSED BOTTOM HOLE LOCATION (BHL)	N (Y) = 2,149,997.24' E (X) = 2,821,874.14'	LAT. = 36.90795474°N LON. = 107.49545400°W	FSL = 438' FEL = 50'
PROPOSED ENTRY POINT (EP)/FIRST TAKE POINT (FTP) ST 1	N (Y) = 2,150,235.34' E (X) = 2,810,535.40'	LAT. = 36.90871271°N LON. = 107.53423439°W	FSL = 703' FEL = 855'
PROPOSED LAST TAKE POINT (LTP) ST 1	N (Y) = 2,150,258.82' E (X) = 2,821,673.23'	LAT. = 36.90867519°N LON. = 107.49613802°W	FSL = 700' FEL = 250'
PROPOSED BOTTOM HOLE LOCATION (BHL) ST 1	N (Y) = 2,150,259.24' E (X) = 2,821,873.23'	LAT. = 36.90867440°N LON. = 107.49545394°W	FSL = 700' FEL = 50'

" OPERATOR CERTIFICATION

I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or undivided mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of such a mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.

Signature: R Marshall Date: 03/23/2018
Printed Name: Randall Marshall

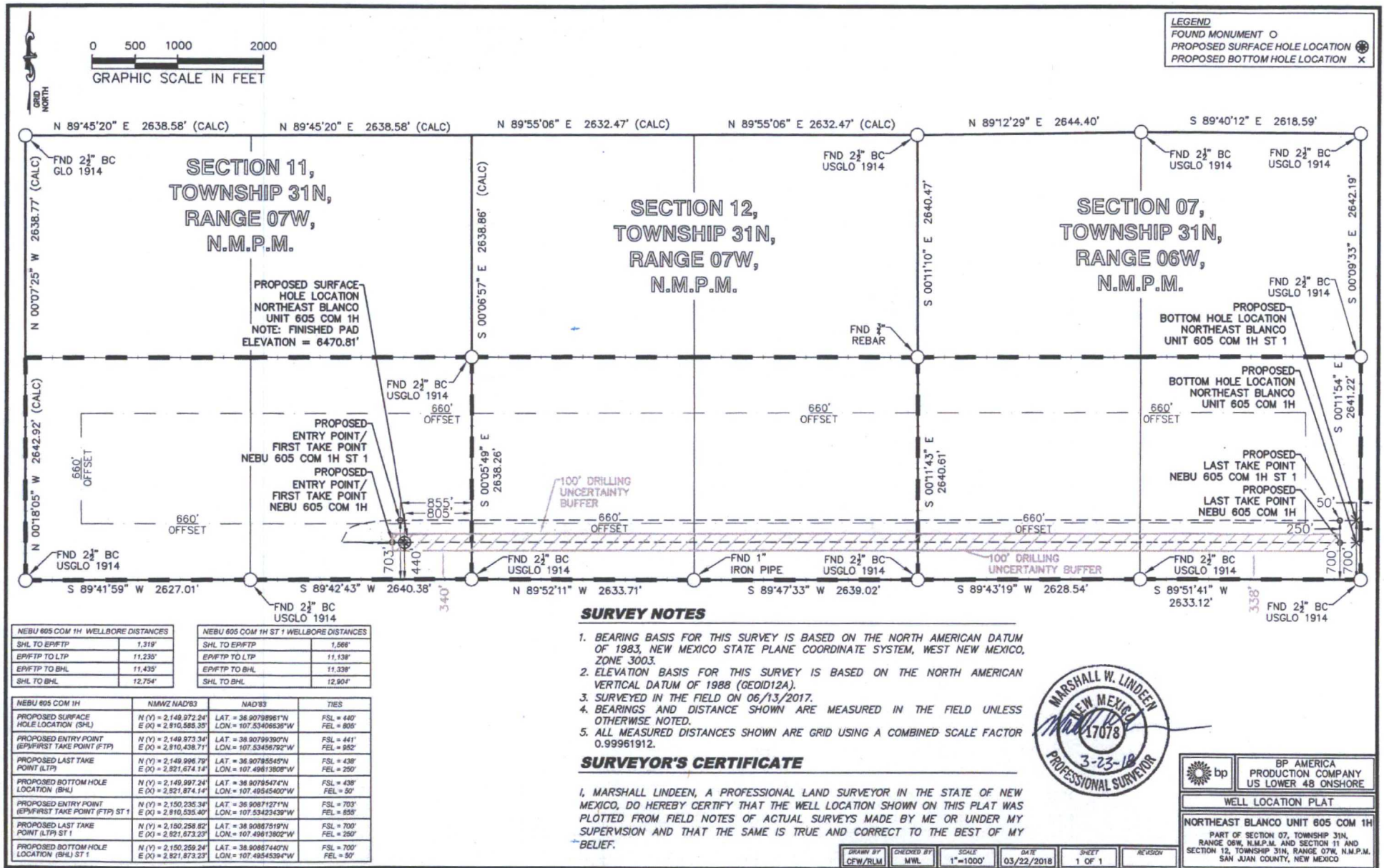
E-mail Address: randall.marshall@bp.com

" SURVEYOR CERTIFICATION

I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief.

Date of Survey: 6-13-17
Signature and Seal of Professional Surveyor:

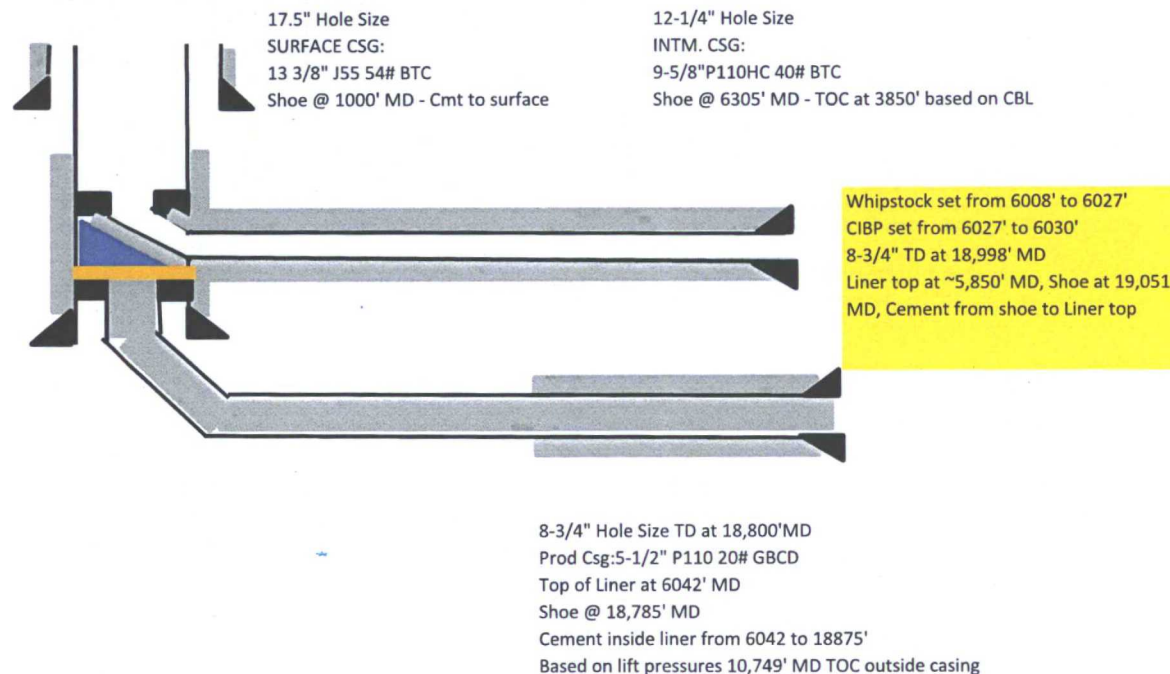
Certificate Number: 17078
17078
MARSHALL W. LINDEEN
NEW MEXICO
17078
3-23-18
PROFESSIONAL SURVEYOR



Depths referenced to GL of 6500' & RKB 25' @ 6525'

Marker	TVD	MD
Animas	25	25
Ojo Alamo	2331	2331
Kirtland	2446	2446
Fruitland Coal	2971	2971
Pictured Cliffs	3301	3301
Cliffhouse	5381	5447
Mancos	6136	6226
TD	7023	18800
New TD	7295	19051

SUNDRY NEBU 605-1H WBD



Production Casing Design - Evacuation/Casing Test (collapse & burst), 100k overpull (tension)

	Collapse	Burst	Tension
Min Safety Factors	1.125	1.100	1.400

	Size	Weight	Grade	Conn	Collapse	Burst	Tension (Pipe Body)	Tension (Connection)
Production	5.5	20	P110	GBCD	13,300	10,640	546,000	568,000
80% of Burst =							8,512	
	Casing Depth TVD	MW in	MW out	Pres in	Pres out	SF		
Collapse	7295	0.00	13.30	0	5045	2.64	Full evacuation with 13.3 ppg c annulus	
Burst	7295	9.0	0	1500	0	7.09	1500 psi casing test	
		Mud Wt	Air Wt	Bouy Wt	BW +100k			
Tension (Pipe Body)	7295	9.0	145,900	125,853	225,853	2.42	100k over pull	
Tension (Connection)	7295	9.0	145,900	125,853	225,853	2.51		
BF= 1- (MW)/65.5 =		0.8626						

New	Open	Save	Wellbore	Options	?	Hide
API Recommended Properties of Casing			API Recommended Properties of Casing			



B.P.

San Juan County, NM NAD83

NEBU 605 Pad

NEBU 605 1H

Lateral Re-Drill

Plan #2

Anticollision Report

22 March, 2018



Scientific Drilling

www.scientificdrilling.com





Anticollision Report



Company:	B.P.	Local Co-ordinate Reference:	Well NEBU 605 1H
Project:	San Juan County, NM NAD83	TVD Reference:	GL 6471' & RKB 25' @ 6496.00usft (Aztec 1000)
Reference Site:	NEBU 605 Pad	MD Reference:	GL 6471' & RKB 25' @ 6496.00usft (Aztec 1000)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	NEBU 605 1H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	Lateral Re-Drill	Database:	Grand Junction District
Reference Design:	Plan #2	Offset TVD Reference:	Reference Datum

Reference	Plan #2		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	MD Interval 100.00usft	Error Model:	ISCWSA
Depth Range:	Unlimited	Scan Method:	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 30,000.00 usft	Error Surface:	Elliptical Conic
Warning Levels Evaluated at:	2.00 Sigma	Casing Method:	Not applied

Survey Tool Program		Date	3/22/2018		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
11.00	981.00	Survey #1 - Gyro Survey (Lateral)	NS-GYRO-MS	North sensing gyrocompassing m/s	
1,060.00	6,008.00	Survey #2 - Surface MWD Survey (Lateral	SDI MWD	SDI MWD - Standard ver 1.0.1	
6,008.00	19,051.42	Plan #2 (Lateral Re-Drill)	SDI MWD	SDI MWD - Standard ver 1.0.1	

Summary						
Site Name	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
NEBU 605 Pad						
NEBU 605 1H - Lateral - Lateral	6,008.00	6,008.00	0.00	0.00	1.727	CC
NEBU 605 1H - Lateral - Lateral	19,003.88	18,800.00	358.96	-45.00	0.889	Stop Drilling, ES, SF

Offset Design NEBU 605 Pad - NEBU 605 1H - Lateral - Lateral														Offset Site Error:	0.00 usft
Survey Program: 11-NS-GYRO-MS, 1060-SDI MWD, 6342-SDI MWD, 7506-SDI MWD														Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance				Separation Factor	Warning			
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			Minimum Separation (usft)		
6,008.00	5,942.85	6,008.00	5,942.85	0.00	0.00	-154.66	5.08	-738.63	0.00	0.00	0.00	1.727 CC			
6,100.00	6,034.49	6,100.00	6,034.51	0.17	0.24	-172.96	6.28	-746.34	0.32	0.07	0.25	1.264 Monitor			
6,200.00	6,134.09	6,199.55	6,133.66	0.54	0.50	-147.96	7.70	-755.11	8.06	7.05	1.02	7.935			
6,300.00	6,232.04	6,296.65	6,230.34	1.24	0.73	-163.20	9.19	-764.07	31.84	29.96	1.88	16.919			
6,400.00	6,328.82	6,395.73	6,329.21	1.86	0.83	-165.79	10.21	-769.66	59.35	56.77	2.59	22.951			
6,500.00	6,425.59	6,498.40	6,431.58	2.35	0.79	-174.02	10.34	-762.72	79.92	76.94	2.98	26.780			
6,600.00	6,522.36	6,601.21	6,532.36	2.77	0.71	174.44	10.12	-742.82	95.73	92.80	2.93	32.667			
6,700.00	6,619.14	6,702.07	6,627.26	3.12	0.69	159.21	9.29	-708.98	111.21	109.26	1.94	57.226			
6,800.00	6,715.91	6,793.52	6,707.44	3.44	0.71	141.60	9.45	-665.21	132.10	130.31	1.80	73.584			
6,900.00	6,811.20	6,879.93	6,776.11	3.68	0.75	104.55	9.84	-612.84	162.59	159.31	3.28	49.527			
7,000.00	6,902.12	6,962.41	6,834.86	3.79	0.79	83.02	12.29	-555.12	194.95	191.15	3.80	51.251			
7,100.00	6,986.45	7,039.06	6,881.38	3.74	0.83	69.37	14.84	-494.31	228.00	224.15	3.85	59.207			
7,200.00	7,062.09	7,112.79	6,919.30	3.47	0.87	60.40	16.44	-431.13	259.68	256.12	3.56	73.000			
7,300.00	7,127.20	7,184.01	6,948.53	2.94	0.91	54.27	16.62	-366.23	289.35	286.31	3.04	95.155			
7,400.00	7,180.16	7,260.13	6,971.63	2.05	0.95	49.73	17.04	-293.75	314.73	312.19	2.54	123.961			
7,500.00	7,219.67	7,332.63	6,986.54	2.29	1.02	46.63	17.44	-222.83	334.73	332.86	1.87	179.120			
7,600.00	7,244.76	7,405.48	6,994.46	4.62	1.62	44.66	17.08	-150.44	349.47	346.56	2.91	120.059			
7,700.00	7,254.81	7,491.94	6,996.36	5.95	2.14	43.62	16.82	-64.02	356.96	354.04	2.93	121.977			
7,800.00	7,255.31	7,595.29	6,995.92	7.08	2.48	43.48	17.28	39.33	357.50	355.03	2.47	144.534			
7,842.09	7,255.45	7,636.05	6,996.10	7.53	2.63	43.47	17.47	80.09	357.40	353.85	3.55	100.631			
7,900.00	7,255.66	7,691.48	6,996.12	8.19	2.85	43.47	17.49	135.53	357.60	352.98	4.62	77.373			

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation



Anticollision Report



Company:	B.P.	Local Co-ordinate Reference:	Well NEBU 605 1H
Project:	San Juan County, NM NAD83	TVD Reference:	GL 6471' & RKB 25' @ 6496.00usft (Aztec 1000)
Reference Site:	NEBU 605 Pad	MD Reference:	GL 6471' & RKB 25' @ 6496.00usft (Aztec 1000)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	NEBU 605 1H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	Lateral Re-Drill	Database:	Grand Junction District
Reference Design:	Plan #2	Offset TVD Reference:	Reference Datum

Offset Design NEBU 605 Pad - NEBU 605 1H - Lateral - Lateral													Offset Site Error:	0.00 usft
Survey Program: 11-NS-GYRO-MS, 1060-SDI MWD, 6342-SDI MWD, 7506-SDI MWD													Offset Well Error:	0.00 usft
Reference	Offset		Semi Major Axis		Distance		Minimum Separation		Warning					
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
8,000.00	7,256.01	7,796.12	6,997.15	9.37	3.42	43.63	16.97	240.15	357.63	350.99	6.64	53.876		
8,100.00	7,256.36	7,894.72	6,998.78	10.67	4.25	43.85	16.51	338.74	357.16	348.31	8.85	40.348		
8,114.25	7,256.41	7,908.22	6,998.93	10.86	4.39	43.87	16.45	352.24	357.15	347.95	9.19	38.852		
8,200.00	7,256.72	7,989.47	6,999.41	12.10	5.35	44.00	15.69	433.49	357.69	346.43	11.26	31.773		
8,300.00	7,257.07	8,086.22	6,999.06	13.69	6.73	44.15	13.88	530.21	359.64	345.76	13.88	25.918		
8,400.00	7,257.42	8,194.53	6,999.97	15.42	8.52	44.40	12.45	638.51	360.33	343.50	16.83	21.416		
8,496.59	7,257.76	8,290.62	7,001.28	17.21	10.26	44.61	11.78	734.58	360.25	340.54	19.71	18.277		
8,500.00	7,257.77	8,294.00	7,001.32	17.27	10.33	44.61	11.75	737.97	360.25	340.44	19.81	18.181		
8,600.00	7,258.13	8,393.36	7,002.27	19.24	12.24	44.76	11.22	837.32	360.35	337.44	22.91	15.728		
8,700.00	7,258.48	8,492.02	7,002.97	21.30	14.23	44.89	10.64	935.97	360.66	334.57	26.09	13.822		
8,800.00	7,258.83	8,590.65	7,003.49	23.43	16.29	45.06	9.50	1,034.60	361.50	332.13	29.37	12.308		
8,900.00	7,259.19	8,687.11	7,003.72	25.62	18.36	45.21	8.24	1,131.05	362.67	329.99	32.68	11.097		
9,000.00	7,259.54	8,786.67	7,003.24	27.86	20.55	45.41	5.80	1,230.58	365.14	329.02	36.13	10.107		
9,100.00	7,259.89	8,891.76	7,002.28	30.14	22.89	45.32	5.54	1,335.66	366.36	326.78	39.58	9.257		
9,200.00	7,260.24	8,996.63	7,001.93	32.45	25.27	45.16	6.43	1,440.53	366.39	323.37	43.02	8.517		
9,290.28	7,260.56	9,084.39	7,002.61	34.56	27.28	45.16	6.99	1,528.28	365.85	319.75	46.11	7.935		
9,300.00	7,260.60	9,093.58	7,002.64	34.79	27.49	45.16	7.00	1,537.47	365.86	319.43	46.44	7.879		
9,400.00	7,260.95	9,188.79	7,002.39	37.15	29.70	45.16	6.68	1,632.68	366.68	316.84	49.84	7.357		
9,500.00	7,261.30	9,287.65	7,001.32	39.53	32.02	45.11	5.91	1,731.53	368.39	315.08	53.30	6.911		
9,600.00	7,261.66	9,394.41	7,000.50	41.92	34.53	45.01	5.86	1,838.28	369.38	312.50	56.87	6.495		
9,700.00	7,262.01	9,504.28	7,002.08	44.33	37.14	45.00	7.35	1,948.13	367.78	307.20	60.58	6.071		
9,800.00	7,262.36	9,602.23	7,004.20	46.74	39.47	45.01	9.25	2,046.04	365.27	301.16	64.11	5.698		
9,900.00	7,262.71	9,699.61	7,005.62	49.17	41.80	44.98	10.78	2,143.39	363.53	295.92	67.61	5.377		
10,000.00	7,263.07	9,800.78	7,006.47	51.61	44.24	44.82	12.89	2,244.54	361.86	290.81	71.06	5.093		
10,100.00	7,263.42	9,900.01	7,006.79	54.05	46.63	44.52	15.72	2,343.73	360.03	285.72	74.31	4.845		
10,200.00	7,263.77	9,997.34	7,006.51	56.50	48.99	44.20	18.12	2,441.03	358.90	281.41	77.49	4.632		
10,300.00	7,264.13	10,096.54	7,005.71	58.96	51.40	43.81	20.61	2,540.19	358.14	277.55	80.59	4.444		
10,400.00	7,264.48	10,199.72	7,004.84	61.42	53.91	43.41	23.18	2,643.33	357.45	273.74	83.71	4.270		
10,500.00	7,264.83	10,304.09	7,006.96	63.89	56.46	43.39	25.21	2,747.66	355.02	267.72	87.29	4.067		
10,600.00	7,265.18	10,403.09	7,009.00	66.36	58.89	43.33	27.48	2,846.62	352.35	261.61	90.74	3.883		
10,700.00	7,265.54	10,500.27	7,010.25	68.83	61.27	43.19	29.72	2,943.76	350.24	256.20	94.04	3.724		
10,800.00	7,265.89	10,596.53	7,010.72	71.31	63.64	43.03	31.40	3,040.01	349.09	251.82	97.28	3.589		
10,899.97	7,266.24	10,694.44	7,010.39	73.79	66.05	42.83	32.63	3,137.90	348.88	248.40	100.48	3.472		
10,900.00	7,266.24	10,694.47	7,010.39	73.79	66.05	42.83	32.63	3,137.94	348.88	248.40	100.48	3.472		
11,000.00	7,266.59	10,793.74	7,009.56	76.28	68.50	42.57	33.93	3,237.19	349.01	245.42	103.59	3.369		
11,100.00	7,266.95	10,897.63	7,009.49	78.76	71.06	42.43	34.93	3,341.07	348.82	241.87	106.94	3.262		
11,200.00	7,267.30	10,998.93	7,011.95	81.25	73.57	42.73	34.58	3,442.33	347.66	236.68	110.98	3.133		
11,300.00	7,267.65	11,096.77	7,014.09	83.74	75.99	42.99	34.28	3,540.16	346.68	231.75	114.93	3.017		
11,400.00	7,268.01	11,195.00	7,015.85	86.24	78.43	43.26	33.56	3,638.37	346.27	227.35	118.93	2.912		
11,409.21	7,268.04	11,203.76	7,015.99	86.47	78.65	43.29	33.47	3,647.13	346.27	226.97	119.30	2.903		
11,500.00	7,268.36	11,290.00	7,017.04	88.73	80.79	43.60	31.80	3,733.34	347.03	224.02	123.01	2.821		
11,600.00	7,268.71	11,386.17	7,017.45	91.23	83.18	43.96	29.03	3,829.47	349.10	221.90	127.20	2.744		
11,700.00	7,269.06	11,490.97	7,017.16	93.73	85.79	44.08	27.60	3,934.26	350.65	219.51	131.13	2.674		
11,800.00	7,269.42	11,586.69	7,016.03	96.23	88.17	44.02	26.88	4,029.96	352.40	217.85	134.56	2.619		
11,900.00	7,269.77	11,687.26	7,014.23	98.73	90.68	43.87	26.26	4,130.52	354.52	216.63	137.90	2.571		
12,000.00	7,270.12	11,785.30	7,011.86	101.23	93.12	43.62	26.02	4,228.53	356.84	215.89	140.95	2.532		
12,100.00	7,270.48	11,888.33	7,009.05	103.73	95.69	43.38	25.28	4,331.52	359.74	215.64	144.09	2.497		
12,200.00	7,270.83	11,999.35	7,010.08	106.24	98.46	43.45	25.54	4,442.52	359.23	211.20	148.03	2.427		
12,300.00	7,271.18	12,099.61	7,012.17	108.74	100.96	43.64	25.79	4,542.76	357.94	205.90	152.04	2.354		
12,400.00	7,271.53	12,198.12	7,014.28	111.25	103.42	43.84	25.92	4,641.25	356.71	200.62	156.09	2.285		
12,500.00	7,271.89	12,294.87	7,016.13	113.76	105.83	44.11	25.25	4,737.98	356.21	195.93	160.29	2.222		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation



Anticollision Report



Company:	B.P.	Local Co-ordinate Reference:	Well NEBU 605 1H
Project:	San Juan County, NM NAD83	TVD Reference:	GL 6471' & RKB 25' @ 6496.00usft (Aztec 1000)
Reference Site:	NEBU 605 Pad	MD Reference:	GL 6471' & RKB 25' @ 6496.00usft (Aztec 1000)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	NEBU 605 1H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	Lateral Re-Drill	Database:	Grand Junction District
Reference Design:	Plan #2	Offset TVD Reference:	Reference Datum

Offset Design NEBU 605 Pad - NEBU 605 1H - Lateral - Lateral													Offset Site Error:	0.00 usft
Survey Program: 11-NS-GYRO-MS, 1060-SDI MWD, 6342-SDI MWD, 7506-SDI MWD													Offset Well Error:	0.00 usft
Reference	Offset	Semi Major Axis		Distance		Warning								
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
12,500.87	7,271.89	12,295.71	7,016.14	113.78	105.86	44.11	25.24	4,738.82	356.21	195.85	160.36	2.221		
12,600.00	7,272.24	12,390.95	7,017.16	116.27	108.24	44.35	24.01	4,834.05	356.74	192.30	164.44	2.169		
12,700.00	7,272.59	12,487.46	7,016.81	118.78	110.66	44.45	22.72	4,930.54	358.34	190.09	168.26	2.130		
12,800.00	7,272.95	12,585.07	7,015.45	121.29	113.10	44.44	21.28	5,028.14	360.76	188.90	171.86	2.099		
12,900.00	7,273.30	12,685.70	7,013.72	123.80	115.62	44.41	19.74	5,128.73	363.46	188.01	175.45	2.072		
13,000.00	7,273.65	12,798.08	7,014.02	126.31	118.43	44.53	18.82	5,241.10	364.24	184.60	179.64	2.028		
13,100.00	7,274.00	12,898.16	7,016.03	128.82	120.94	44.75	18.73	5,341.17	363.27	179.39	183.88	1.976		
13,190.32	7,274.32	12,985.29	7,017.56	131.09	123.12	44.96	18.25	5,428.28	362.86	175.14	187.71	1.933		
13,200.00	7,274.36	12,994.57	7,017.70	131.33	123.36	44.98	18.16	5,437.56	362.86	174.73	188.13	1.929		
13,300.00	7,274.71	13,089.79	7,018.54	133.85	125.75	45.20	16.91	5,532.77	363.57	171.24	192.33	1.890		
13,400.00	7,275.06	13,184.20	7,018.38	136.36	128.12	45.42	14.58	5,627.14	365.84	169.28	196.56	1.861		
13,500.00	7,275.41	13,287.49	7,017.62	138.87	130.71	45.68	11.35	5,730.38	369.00	167.95	201.05	1.835		
13,600.00	7,275.77	13,395.67	7,019.00	141.39	133.43	45.96	10.03	5,838.54	369.34	163.60	205.74	1.795		
13,662.47	7,275.99	13,457.58	7,019.67	142.96	134.98	46.04	9.83	5,900.45	369.27	160.95	208.32	1.773		
13,700.00	7,276.12	13,494.25	7,019.94	143.90	135.90	46.08	9.70	5,937.11	369.31	159.49	209.82	1.760		
13,800.00	7,276.47	13,594.22	7,020.44	146.42	138.41	46.16	9.31	6,037.08	369.65	155.83	213.82	1.729		
13,900.00	7,276.83	13,693.72	7,020.95	148.94	140.91	46.23	9.01	6,136.58	369.91	152.12	217.79	1.698		
14,000.00	7,277.18	13,792.27	7,021.43	151.45	143.39	46.34	8.33	6,235.13	370.47	148.60	221.86	1.670		
14,100.00	7,277.53	13,890.91	7,021.37	153.97	145.86	46.40	7.62	6,333.77	371.42	145.65	225.77	1.645		
14,200.00	7,277.88	13,992.00	7,021.03	156.49	148.40	46.40	7.09	6,434.85	372.43	142.86	229.57	1.622		
14,300.00	7,278.24	14,090.32	7,021.01	159.00	150.87	46.47	6.20	6,533.17	373.50	139.95	233.55	1.599		
14,400.00	7,278.59	14,189.85	7,020.90	161.52	153.38	46.58	4.90	6,632.69	374.92	137.24	237.68	1.577		
14,500.00	7,278.94	14,292.37	7,020.64	164.04	155.95	46.60	4.28	6,735.21	375.92	134.35	241.57	1.556		
14,600.00	7,279.30	14,393.46	7,020.48	166.56	158.50	46.59	4.05	6,836.30	376.60	131.25	245.34	1.535		
14,700.00	7,279.65	14,494.29	7,020.40	169.08	161.03	46.52	4.42	6,937.12	376.78	127.86	248.92	1.514		
14,800.00	7,280.00	14,596.13	7,020.34	171.60	163.59	46.47	4.69	7,038.96	377.02	124.47	252.56	1.493 Monitor		
14,900.00	7,280.35	14,696.45	7,021.03	174.12	166.11	46.46	5.39	7,139.28	376.44	120.15	256.29	1.469 Monitor		
15,000.00	7,280.71	14,798.45	7,021.69	176.64	168.67	46.47	5.83	7,241.28	376.08	115.94	260.14	1.446 Monitor		
15,100.00	7,281.06	14,898.03	7,022.46	179.16	171.18	46.41	7.04	7,340.85	375.07	111.37	263.70	1.422 Monitor		
15,200.00	7,281.41	15,005.04	7,023.84	181.68	173.86	46.40	8.42	7,447.84	373.66	106.10	267.56	1.397 Monitor		
15,300.00	7,281.77	15,101.24	7,025.60	184.20	176.28	46.37	10.35	7,544.00	371.35	100.18	271.17	1.369 Monitor		
15,400.00	7,282.12	15,197.29	7,027.20	186.72	178.69	46.49	10.78	7,640.03	370.27	94.95	275.32	1.345 Monitor		
15,446.51	7,282.28	15,241.74	7,028.09	187.89	179.81	46.63	10.35	7,684.47	370.14	92.57	277.57	1.333 Monitor		
15,500.00	7,282.47	15,292.79	7,028.98	189.24	181.10	46.80	9.56	7,735.51	370.32	90.09	280.23	1.321 Monitor		
15,600.00	7,282.82	15,389.90	7,030.69	191.76	183.55	47.24	7.05	7,832.57	371.40	85.70	285.69	1.300 Monitor		
15,700.00	7,283.18	15,489.80	7,031.91	194.28	186.06	47.63	4.43	7,932.42	372.90	81.84	291.06	1.281 Monitor		
15,800.00	7,283.53	15,595.34	7,032.33	196.80	188.72	47.74	3.67	8,037.96	373.56	78.12	295.43	1.264 Monitor		
15,900.00	7,283.88	15,693.99	7,032.53	199.32	191.21	47.77	3.42	8,136.61	373.99	74.61	299.38	1.249 Shut In Offsets		
16,000.00	7,284.23	15,806.20	7,034.23	201.85	194.03	47.80	4.86	8,248.79	372.38	68.81	303.57	1.227 Shut In Offsets		
16,100.00	7,284.59	15,906.82	7,034.95	204.37	196.55	47.42	9.14	8,349.32	369.15	63.30	305.85	1.207 Shut In Offsets		
16,200.00	7,284.94	15,999.73	7,034.54	206.89	198.88	46.94	13.04	8,442.13	366.78	59.24	307.54	1.193 Shut In Offsets		
16,235.37	7,285.07	16,030.92	7,033.90	207.78	199.66	46.75	14.06	8,473.31	366.58	58.57	308.01	1.190 Shut In Offsets		
16,300.00	7,285.29	16,091.81	7,031.86	209.41	201.19	46.34	15.64	8,534.14	367.09	58.47	308.62	1.189 Shut In Offsets		
16,400.00	7,285.65	16,193.11	7,028.21	211.94	203.73	45.61	18.41	8,635.33	368.03	58.80	309.23	1.190 Shut In Offsets		
16,500.00	7,286.00	16,296.62	7,024.97	214.46	206.32	44.87	21.74	8,738.74	368.35	58.64	309.71	1.189 Shut In Offsets		
16,600.00	7,286.35	16,398.70	7,024.26	216.98	208.89	44.53	23.97	8,840.80	367.70	55.83	311.87	1.179 Shut In Offsets		
16,700.00	7,286.70	16,500.05	7,024.23	219.50	211.44	44.31	25.86	8,942.12	366.82	52.30	314.51	1.166 Shut In Offsets		
16,800.00	7,287.06	16,600.93	7,024.72	222.03	213.97	44.12	27.84	9,042.99	365.50	48.18	317.32	1.152 Shut In Offsets		
16,900.00	7,287.41	16,703.24	7,025.36	224.55	216.54	43.91	30.16	9,145.27	363.88	43.85	320.02	1.137 Shut In Offsets		
17,000.00	7,287.76	16,806.03	7,026.26	227.07	219.12	43.63	33.39	9,248.00	361.47	39.15	322.33	1.121 Shut In Offsets		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation



Anticollision Report



Company:	B.P.	Local Co-ordinate Reference:	Well NEBU 605 1H
Project:	San Juan County, NM NAD83	TVD Reference:	GL 6471' & RKB 25' @ 6496.00usft (Aztec 1000)
Reference Site:	NEBU 605 Pad	MD Reference:	GL 6471' & RKB 25' @ 6496.00usft (Aztec 1000)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	NEBU 605 1H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	Lateral Re-Drill	Database:	Grand Junction District
Reference Design:	Plan #2	Offset TVD Reference:	Reference Datum

Offset Design NEBU 605 Pad - NEBU 605 1H - Lateral - Lateral												Offset Site Error:	0.00 usft
Survey Program: 11-NS-GYRO-MS, 1060-SDI MWD, 6342-SDI MWD, 7506-SDI MWD												Offset Well Error:	0.00 usft
Reference	Offset		Semi Major Axis		Distance		Minimum Separation		Warning				
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
17,100.00	7,288.12	16,899.62	7,027.57	229.60	221.48	43.54	35.30	9,341.56	359.45	34.06	325.40	1.105	Shut In Offsets
17,200.00	7,288.47	17,000.19	7,029.13	232.12	224.01	43.66	35.65	9,442.12	358.50	28.88	329.61	1.088	Shut In Offsets
17,254.30	7,288.66	17,050.30	7,029.70	233.49	225.27	43.69	35.82	9,492.22	358.14	26.46	331.69	1.080	Shut In Offsets
17,300.00	7,288.82	17,092.05	7,029.75	234.64	226.32	43.71	35.68	9,533.97	358.40	25.04	333.36	1.075	Shut In Offsets
17,400.00	7,289.17	17,193.21	7,029.22	237.17	228.87	43.68	35.26	9,635.12	359.45	22.57	336.89	1.067	Shut In Offsets
17,500.00	7,289.53	17,296.93	7,028.78	239.69	231.49	43.54	35.94	9,738.85	359.72	19.86	339.86	1.058	Shut In Offsets
17,600.00	7,289.88	17,399.07	7,028.79	242.21	234.06	43.33	37.64	9,840.97	358.96	16.54	342.42	1.048	Shut In Offsets
17,645.13	7,290.04	17,441.15	7,028.96	243.35	235.12	43.30	37.96	9,883.05	358.77	14.91	343.87	1.043	Shut In Offsets
17,700.00	7,290.23	17,493.46	7,029.29	244.74	236.44	43.38	37.56	9,935.35	359.03	12.83	346.20	1.037	Shut In Offsets
17,800.00	7,290.59	17,594.00	7,029.87	247.26	238.97	43.54	36.62	10,035.89	359.65	8.98	350.67	1.026	Shut In Offsets
17,900.00	7,290.94	17,694.36	7,030.28	249.79	241.50	43.65	35.96	10,136.24	360.21	5.33	354.88	1.015	Shut In Offsets
18,000.00	7,291.29	17,794.98	7,030.91	252.31	244.04	43.76	35.44	10,236.87	360.52	1.37	359.15	1.004	Shut In Offsets
18,100.00	7,291.64	17,895.30	7,031.77	254.84	246.57	43.93	34.61	10,337.18	360.87	-2.88	363.75	0.992	Stop Drilling
18,200.00	7,292.00	17,997.42	7,032.95	257.36	249.15	44.10	34.13	10,439.29	360.77	-7.61	368.37	0.979	Stop Drilling
18,300.00	7,292.35	18,099.38	7,034.75	259.89	251.72	44.33	33.81	10,541.23	360.12	-13.18	373.30	0.965	Stop Drilling
18,400.00	7,292.70	18,199.37	7,036.77	262.41	254.24	44.54	33.80	10,641.20	359.08	-19.07	378.15	0.950	Stop Drilling
18,481.48	7,292.99	18,277.57	7,038.20	264.47	256.21	44.72	33.45	10,719.38	358.60	-23.55	382.15	0.938	Stop Drilling
18,500.00	7,293.05	18,294.96	7,038.42	264.93	256.65	44.77	33.29	10,736.77	358.63	-24.41	383.04	0.936	Stop Drilling
18,600.00	7,293.41	18,391.88	7,038.99	267.46	259.09	44.96	32.02	10,833.69	359.53	-28.24	387.77	0.927	Stop Drilling
18,700.00	7,293.76	18,493.65	7,039.08	269.98	261.66	45.07	30.98	10,935.45	360.60	-31.55	392.15	0.920	Stop Drilling
18,800.00	7,294.11	18,597.80	7,039.69	272.51	264.29	45.14	30.76	11,039.60	360.74	-35.64	396.37	0.910	Stop Drilling
18,900.00	7,294.47	18,699.22	7,040.65	275.03	266.85	45.16	31.42	11,141.01	360.01	-40.21	400.22	0.900	Stop Drilling
19,000.00	7,294.82	18,799.91	7,041.68	277.56	269.38	45.15	32.40	11,241.69	358.99	-44.91	403.90	0.889	Stop Drilling
19,003.88	7,294.83	18,800.00	7,041.69	277.66	269.38	45.15	32.40	11,241.78	358.96	-45.00	403.97	0.889	Stop Drilling, ES, SF
19,051.42	7,295.00	18,800.00	7,041.69	278.86	269.38	45.15	32.40	11,241.78	362.10	-42.76	404.85	0.894	Stop Drilling

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation



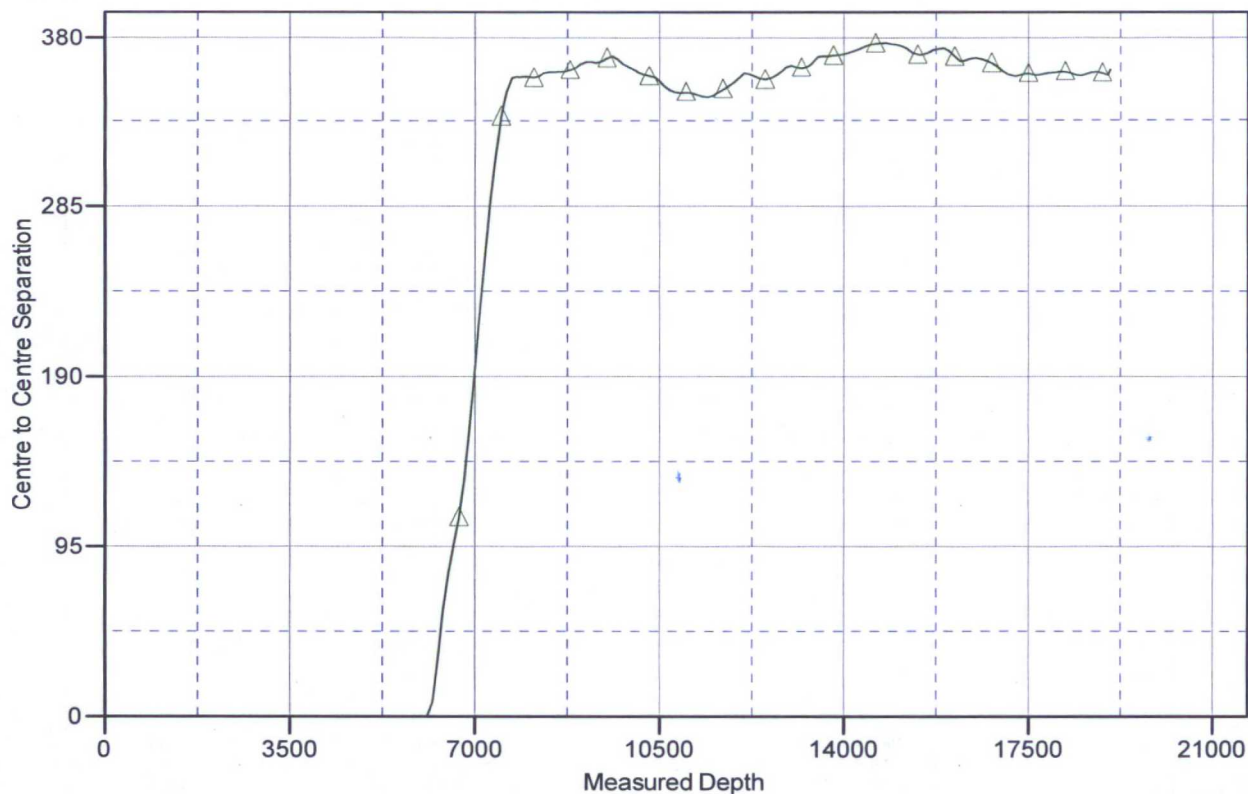
Company: B.P.
Project: San Juan County, NM NAD83
Reference Site: NEBU 605 Pad
Site Error: 0.00 usft
Reference Well: NEBU 605 1H
Well Error: 0.00 usft
Reference Wellbore: Lateral Re-Drill
Reference Design: Plan #2

Local Co-ordinate Reference: Well NEBU 605 1H
TVD Reference: GL 6471' & RKB 25' @ 6496.00usft (Aztec 1000)
MD Reference: GL 6471' & RKB 25' @ 6496.00usft (Aztec 1000)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: Grand Junction District
Offset TVD Reference: Reference Datum

Reference Depths are relative to GL 6471' & RKB 25' @ 6496.00usft (A)
Offset Depths are relative to Offset Datum
Central Meridian is -107.833334

Coordinates are relative to: NEBU 605 1H
Coordinate System is US State Plane 1983, New Mexico Western Zone
Grid Convergence at Surface is: 0.18°

Ladder Plot



LEGEND

▲ NEBU 605 1H, Lateral, Lateral V0



Anticollision Report

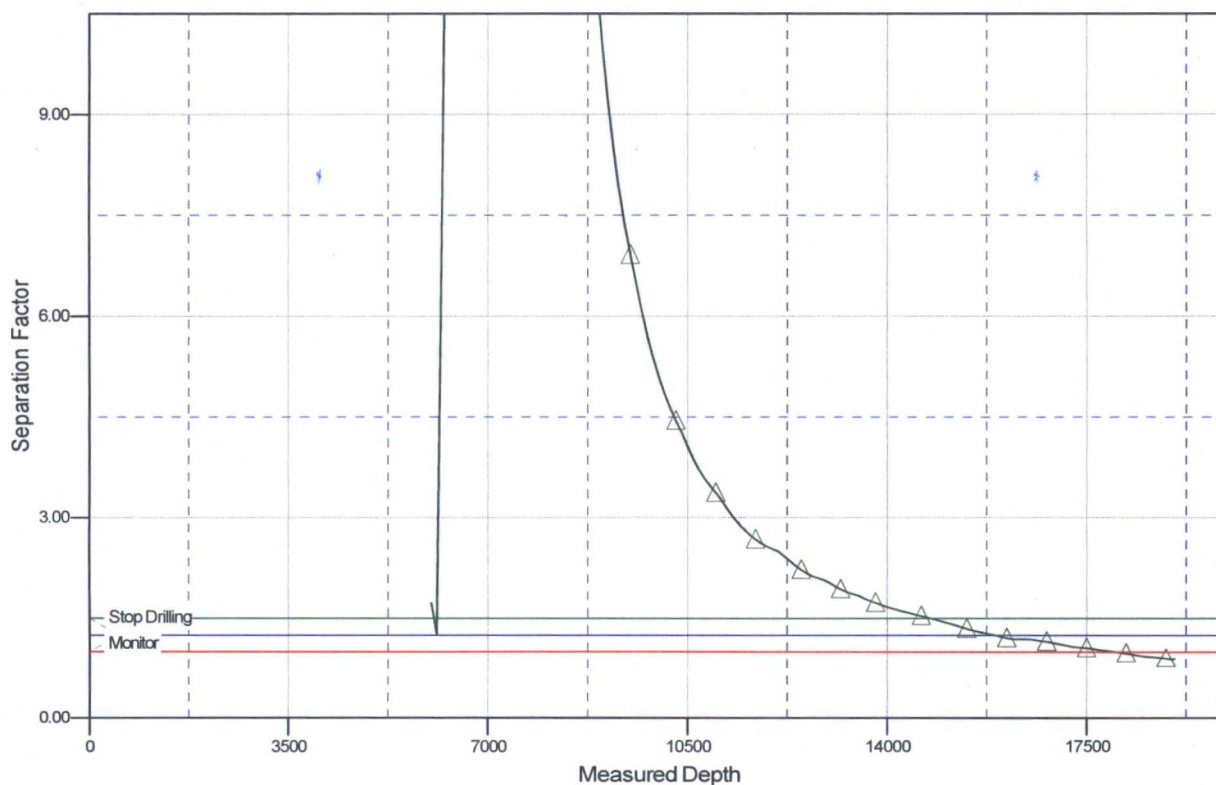


Company:	B.P.	Local Co-ordinate Reference:	Well NEBU 605 1H
Project:	San Juan County, NM NAD83	TVD Reference:	GL 6471' & RKB 25' @ 6496.00usft (Aztec 1000)
Reference Site:	NEBU 605 Pad	MD Reference:	GL 6471' & RKB 25' @ 6496.00usft (Aztec 1000)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	NEBU 605 1H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	Lateral Re-Drill	Database:	Grand Junction District
Reference Design:	Plan #2	Offset TVD Reference:	Reference Datum

Reference Depths are relative to GL 6471' & RKB 25' @ 6496.00usft (A)
Offset Depths are relative to Offset Datum
Central Meridian is -107.8333334

Coordinates are relative to: NEBU 605 1H
Coordinate System is US State Plane 1983, New Mexico Western Zone
Grid Convergence at Surface is: 0.18°

Separation Factor Plot



LEGEND

▲ NEBU 605 1H, Lateral, Lateral V0



B.P.

San Juan County, NM NAD83

NEBU 605 Pad

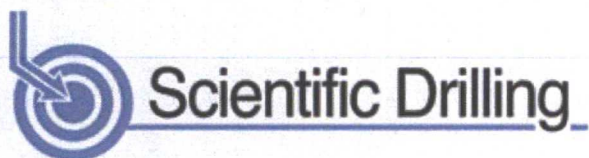
NEBU 605 1H

Lateral Re-Drill

Plan: Plan #2

Standard Planning Report

22 March, 2018



www.scientificdrilling.com



Company: B.P.
Project: San Juan County, NM NAD83
Site: NEBU 605 Pad
Well: NEBU 605 1H
Wellbore: Lateral Re-Drill
Design: Plan #2

PROJECT DETAILS: San Juan County, NM NAD83

Geodetic System: US State Plane 1983
Datum: North American Datum 1983
Ellipsoid: GRS 1980
Zone: New Mexico Western Zone
System Datum: Mean Sea Level
Local North: Grid



Azimuths to Grid North
True North: -0.18°
Magnetic North: 8.84°

Magnetic Field
Strength: 49959.4nT
Dip Angle: 63.50°
Date: 3/16/2018
Model: HDGM

WELL DETAILS: NEBU 605 1H

GL 6471' & RKB 25' @ 6496.00usft (Aztec 1000)
+N/-S +E/-W Northing Easting Latitude Longitude
0.00 0.00 2149972.24 2810585.35 36.9079896 -107.5340664

Plan: Plan #2 (NEBU 605 1H/Lateral Re-Drill)

Created By: Janie Collins Date: 9:18, March 22 2018

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting
605 1H LP	7255.00	263.10	-49.95	2150235.34	2810535.40
605 1H RD BHL	7295.00	287.00	11287.88	2150259.24	2821873.23
605 1H First Prod	7255.00	263.10	-147.21	2150235.34	2810438.14
605 1H RD Last Prod	7295.00	286.58	11087.88	2150258.82	2821673.23

SECTION DETAILS

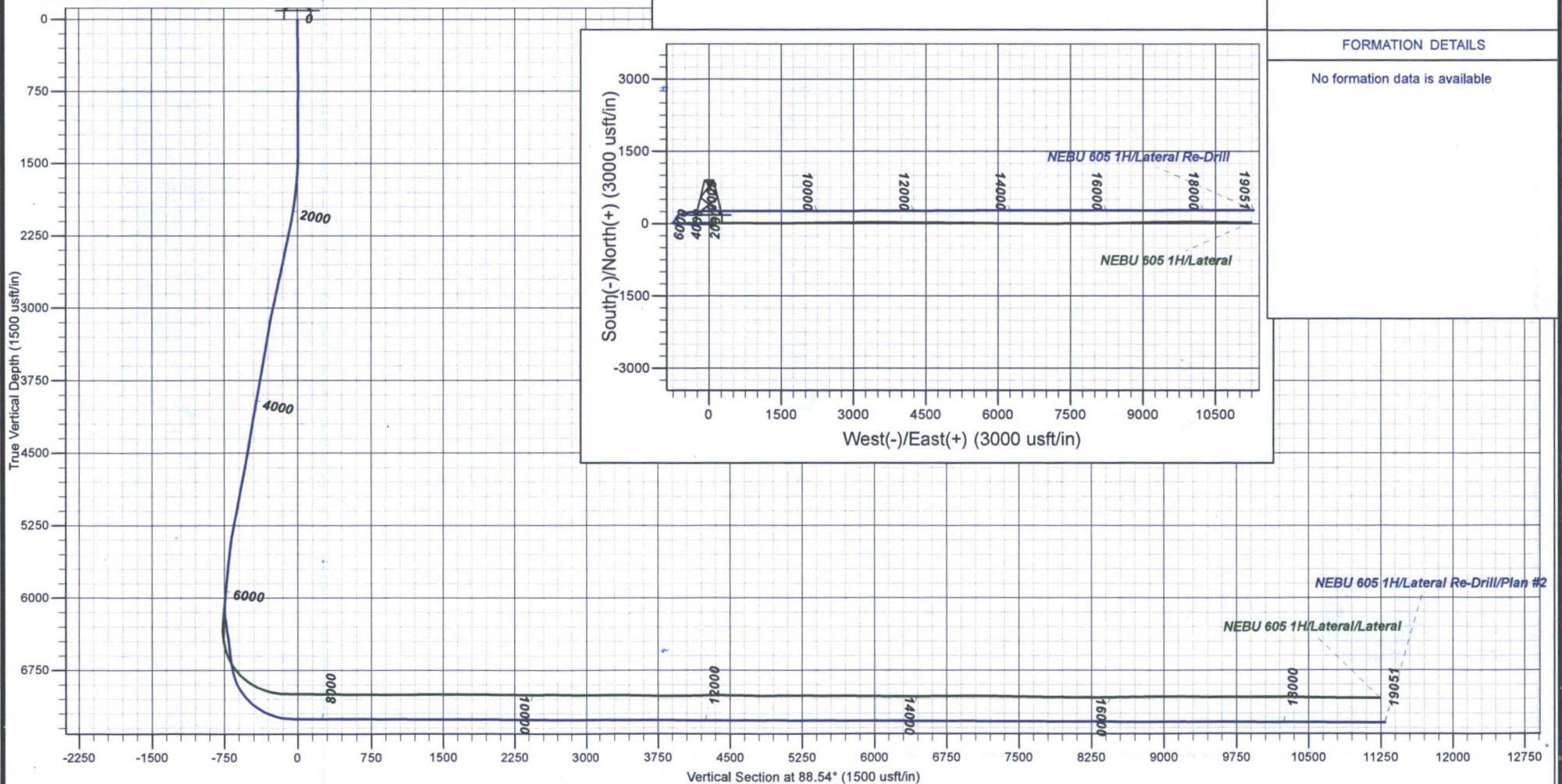
MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSec	Target
6008.00	5.07	279.22	5942.85	5.08	-738.63	0.00	0.00	-738.26	
6008.00	5.07	279.22	6032.49	6.35	-746.47	0.00	0.00	-746.07	
6287.30	14.59	29.84	6219.75	28.54	-742.83	9.00	126.40	-741.87	
6795.99	14.59	29.84	6712.03	139.73	-679.06	0.00	0.00	-675.29	
7713.49	89.80	89.88	7255.00	263.10	-49.95	9.00	60.90	-43.25	605 1H LP
19051.41	89.80	89.88	7295.00	287.00	11287.88	0.00	0.00	11291.53	605 1H RD BHL

CASING DETAILS

No casing data is available

FORMATION DETAILS

No formation data is available





Planning Report



Database:	Grand Junction District	Local Co-ordinate Reference:	Well NEBU 605 1H
Company:	B.P.	TVD Reference:	GL 6471' & RKB 25' @ 6496.00usft (Aztec 1000)
Project:	San Juan County, NM NAD83	MD Reference:	GL 6471' & RKB 25' @ 6496.00usft (Aztec 1000)
Site:	NEBU 605 Pad	North Reference:	Grid
Well:	NEBU 605 1H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Lateral Re-Drill		
Design:	Plan #2		

Project	San Juan County, NM NAD83		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Western Zone		

Site	NEBU 605 Pad				
Site Position:		Northing:	2,149,972.24 usft	Latitude:	36.9079896
From:	Map	Easting:	2,810,585.35 usft	Longitude:	-107.5340664
Position Uncertainty:	0.00 usft	Slot Radius:	13.20 in	Grid Convergence:	0.18 °

Well	NEBU 605 1H					
Well Position	+N/-S	0.00 usft	Northing:	2,149,972.24 usft	Latitude:	36.9079896
	+E/-W	0.00 usft	Easting:	2,810,585.35 usft	Longitude:	-107.5340664
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	6,471.00 usft

Wellbore	Lateral Re-Drill				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	3/16/2018	9.02	63.50	49,959

Design	Plan #2				
Audit Notes:					
Version:	Phase:	PLAN	Tie On Depth:	6,008.00	
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.00	0.00	0.00	88.54	

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
6,008.00	5.07	279.22	5,942.85	5.08	-738.63	0.00	0.00	0.00	0.00	
6,098.00	5.07	279.22	6,032.49	6.35	-746.47	0.00	0.00	0.00	0.00	
6,287.30	14.59	29.84	6,219.75	28.54	-742.83	9.00	5.03	58.44	126.40	
6,795.99	14.59	29.84	6,712.03	139.73	-679.06	0.00	0.00	0.00	0.00	
7,713.49	89.80	89.88	7,255.00	263.10	-49.95	9.00	8.20	6.54	60.90	605 1H LP
19,051.42	89.80	89.88	7,295.00	287.00	11,287.88	0.00	0.00	0.00	0.00	605 1H RD BHL



Planning Report



Database:	Grand Junction District	Local Co-ordinate Reference:	Well NEBU 605 1H
Company:	B.P.	TVD Reference:	GL 6471' & RKB 25' @ 6496.00usft (Aztec 1000)
Project:	San Juan County, NM NAD83	MD Reference:	GL 6471' & RKB 25' @ 6496.00usft (Aztec 1000)
Site:	NEBU 605 Pad	North Reference:	Grid
Well:	NEBU 605 1H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Lateral Re-Drill		
Design:	Plan #2		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
6,008.00	5.07	279.22	5,942.85	5.08	-738.63	-738.26	0.00	0.00	0.00
6,098.00	5.07	279.22	6,032.49	6.35	-746.47	-746.07	0.00	0.00	0.00
6,100.00	4.96	280.89	6,034.49	6.38	-746.64	-746.24	9.00	-5.23	83.77
6,200.00	7.39	12.39	6,134.09	13.49	-749.52	-748.93	9.00	2.43	91.49
6,287.30	14.59	29.84	6,219.75	28.54	-742.83	-741.87	9.00	8.25	19.99
6,300.00	14.59	29.84	6,232.04	31.32	-741.24	-740.20	0.00	0.00	0.00
6,400.00	14.59	29.84	6,328.82	53.17	-728.70	-727.12	0.00	0.00	0.00
6,500.00	14.59	29.84	6,425.59	75.03	-716.17	-714.03	0.00	0.00	0.00
6,600.00	14.59	29.84	6,522.36	96.89	-703.63	-700.94	0.00	0.00	0.00
6,700.00	14.59	29.84	6,619.14	118.75	-691.09	-687.85	0.00	0.00	0.00
6,795.99	14.59	29.84	6,712.03	139.73	-679.06	-675.29	0.00	0.00	0.00
6,800.00	14.77	31.07	6,715.91	140.60	-678.55	-674.75	9.00	4.46	30.84
6,900.00	20.79	53.44	6,811.20	162.14	-657.67	-653.34	9.00	6.01	22.37
7,000.00	28.37	65.23	6,902.12	182.71	-621.77	-616.92	9.00	7.59	11.78
7,100.00	36.57	72.21	6,986.45	201.80	-571.73	-566.41	9.00	8.19	6.99
7,200.00	45.04	76.90	7,062.09	218.96	-508.77	-503.05	9.00	8.47	4.69
7,300.00	53.65	80.36	7,127.20	233.75	-434.46	-428.38	9.00	8.61	3.46
7,400.00	62.34	83.13	7,180.16	245.81	-350.62	-344.26	9.00	8.69	2.77
7,500.00	71.07	85.49	7,219.67	254.85	-259.32	-252.76	9.00	8.74	2.36
7,600.00	79.84	87.61	7,244.76	260.64	-162.80	-156.12	9.00	8.76	2.12
7,616.61	81.29	87.94	7,247.48	261.28	-146.42	-139.74	9.00	8.77	2.04
605 1H First Prod									
7,700.00	88.61	89.61	7,254.81	263.04	-63.44	-56.73	9.00	8.78	2.00
7,713.49	89.80	89.88	7,255.00	263.10	-49.95	-43.25	9.00	8.78	1.98
605 1H LP									
7,800.00	89.80	89.88	7,255.31	263.28	36.56	43.24	0.00	0.00	0.00
7,900.00	89.80	89.88	7,255.66	263.49	136.56	143.21	0.00	0.00	0.00
8,000.00	89.80	89.88	7,256.01	263.70	236.56	243.18	0.00	0.00	0.00
8,100.00	89.80	89.88	7,256.36	263.91	336.56	343.16	0.00	0.00	0.00
8,200.00	89.80	89.88	7,256.72	264.13	436.56	443.13	0.00	0.00	0.00
8,300.00	89.80	89.88	7,257.07	264.34	536.56	543.10	0.00	0.00	0.00
8,400.00	89.80	89.88	7,257.42	264.55	636.56	643.07	0.00	0.00	0.00
8,500.00	89.80	89.88	7,257.77	264.76	736.55	743.05	0.00	0.00	0.00
8,600.00	89.80	89.88	7,258.13	264.97	836.55	843.02	0.00	0.00	0.00
8,700.00	89.80	89.88	7,258.48	265.18	936.55	942.99	0.00	0.00	0.00
8,800.00	89.80	89.88	7,258.83	265.39	1,036.55	1,042.96	0.00	0.00	0.00
8,900.00	89.80	89.88	7,259.19	265.60	1,136.55	1,142.93	0.00	0.00	0.00
9,000.00	89.80	89.88	7,259.54	265.81	1,236.55	1,242.91	0.00	0.00	0.00
9,100.00	89.80	89.88	7,259.89	266.02	1,336.55	1,342.88	0.00	0.00	0.00
9,200.00	89.80	89.88	7,260.24	266.23	1,436.55	1,442.85	0.00	0.00	0.00
9,300.00	89.80	89.88	7,260.60	266.44	1,536.55	1,542.82	0.00	0.00	0.00
9,400.00	89.80	89.88	7,260.95	266.66	1,636.55	1,642.80	0.00	0.00	0.00
9,500.00	89.80	89.88	7,261.30	266.87	1,736.55	1,742.77	0.00	0.00	0.00
9,600.00	89.80	89.88	7,261.66	267.08	1,836.54	1,842.74	0.00	0.00	0.00
9,700.00	89.80	89.88	7,262.01	267.29	1,936.54	1,942.71	0.00	0.00	0.00
9,800.00	89.80	89.88	7,262.36	267.50	2,036.54	2,042.68	0.00	0.00	0.00
9,900.00	89.80	89.88	7,262.71	267.71	2,136.54	2,142.66	0.00	0.00	0.00
10,000.00	89.80	89.88	7,263.07	267.92	2,236.54	2,242.63	0.00	0.00	0.00
10,100.00	89.80	89.88	7,263.42	268.13	2,336.54	2,342.60	0.00	0.00	0.00
10,200.00	89.80	89.88	7,263.77	268.34	2,436.54	2,442.57	0.00	0.00	0.00
10,300.00	89.80	89.88	7,264.13	268.55	2,536.54	2,542.55	0.00	0.00	0.00
10,400.00	89.80	89.88	7,264.48	268.76	2,636.54	2,642.52	0.00	0.00	0.00



Planning Report



Database:	Grand Junction District	Local Co-ordinate Reference:	Well NEBU 605 1H
Company:	B.P.	TVD Reference:	GL 6471' & RKB 25' @ 6496.00usft (Aztec 1000)
Project:	San Juan County, NM NAD83	MD Reference:	GL 6471' & RKB 25' @ 6496.00usft (Aztec 1000)
Site:	NEBU 605 Pad	North Reference:	Grid
Well:	NEBU 605 1H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Lateral Re-Drill		
Design:	Plan #2		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
10,500.00	89.80	89.88	7,264.83	268.97	2,736.54	2,742.49	0.00	0.00	0.00
10,600.00	89.80	89.88	7,265.18	269.18	2,836.54	2,842.46	0.00	0.00	0.00
10,700.00	89.80	89.88	7,265.54	269.40	2,936.54	2,942.43	0.00	0.00	0.00
10,800.00	89.80	89.88	7,265.89	269.61	3,036.53	3,042.41	0.00	0.00	0.00
10,900.00	89.80	89.88	7,266.24	269.82	3,136.53	3,142.38	0.00	0.00	0.00
11,000.00	89.80	89.88	7,266.59	270.03	3,236.53	3,242.35	0.00	0.00	0.00
11,100.00	89.80	89.88	7,266.95	270.24	3,336.53	3,342.32	0.00	0.00	0.00
11,200.00	89.80	89.88	7,267.30	270.45	3,436.53	3,442.30	0.00	0.00	0.00
11,300.00	89.80	89.88	7,267.65	270.66	3,536.53	3,542.27	0.00	0.00	0.00
11,400.00	89.80	89.88	7,268.01	270.87	3,636.53	3,642.24	0.00	0.00	0.00
11,500.00	89.80	89.88	7,268.36	271.08	3,736.53	3,742.21	0.00	0.00	0.00
11,600.00	89.80	89.88	7,268.71	271.29	3,836.53	3,842.18	0.00	0.00	0.00
11,700.00	89.80	89.88	7,269.06	271.50	3,936.53	3,942.16	0.00	0.00	0.00
11,800.00	89.80	89.88	7,269.42	271.71	4,036.53	4,042.13	0.00	0.00	0.00
11,900.00	89.80	89.88	7,269.77	271.93	4,136.53	4,142.10	0.00	0.00	0.00
12,000.00	89.80	89.88	7,270.12	272.14	4,236.52	4,242.07	0.00	0.00	0.00
12,100.00	89.80	89.88	7,270.48	272.35	4,336.52	4,342.05	0.00	0.00	0.00
12,200.00	89.80	89.88	7,270.83	272.56	4,436.52	4,442.02	0.00	0.00	0.00
12,300.00	89.80	89.88	7,271.18	272.77	4,536.52	4,541.99	0.00	0.00	0.00
12,400.00	89.80	89.88	7,271.53	272.98	4,636.52	4,641.96	0.00	0.00	0.00
12,500.00	89.80	89.88	7,271.89	273.19	4,736.52	4,741.93	0.00	0.00	0.00
12,600.00	89.80	89.88	7,272.24	273.40	4,836.52	4,841.91	0.00	0.00	0.00
12,700.00	89.80	89.88	7,272.59	273.61	4,936.52	4,941.88	0.00	0.00	0.00
12,800.00	89.80	89.88	7,272.95	273.82	5,036.52	5,041.85	0.00	0.00	0.00
12,900.00	89.80	89.88	7,273.30	274.03	5,136.52	5,141.82	0.00	0.00	0.00
13,000.00	89.80	89.88	7,273.65	274.24	5,236.52	5,241.80	0.00	0.00	0.00
13,100.00	89.80	89.88	7,274.00	274.45	5,336.52	5,341.77	0.00	0.00	0.00
13,200.00	89.80	89.88	7,274.36	274.67	5,436.51	5,441.74	0.00	0.00	0.00
13,300.00	89.80	89.88	7,274.71	274.88	5,536.51	5,541.71	0.00	0.00	0.00
13,400.00	89.80	89.88	7,275.06	275.09	5,636.51	5,641.68	0.00	0.00	0.00
13,500.00	89.80	89.88	7,275.41	275.30	5,736.51	5,741.66	0.00	0.00	0.00
13,600.00	89.80	89.88	7,275.77	275.51	5,836.51	5,841.63	0.00	0.00	0.00
13,700.00	89.80	89.88	7,276.12	275.72	5,936.51	5,941.60	0.00	0.00	0.00
13,800.00	89.80	89.88	7,276.47	275.93	6,036.51	6,041.57	0.00	0.00	0.00
13,900.00	89.80	89.88	7,276.83	276.14	6,136.51	6,141.54	0.00	0.00	0.00
14,000.00	89.80	89.88	7,277.18	276.35	6,236.51	6,241.52	0.00	0.00	0.00
14,100.00	89.80	89.88	7,277.53	276.56	6,336.51	6,341.49	0.00	0.00	0.00
14,200.00	89.80	89.88	7,277.88	276.77	6,436.51	6,441.46	0.00	0.00	0.00
14,300.00	89.80	89.88	7,278.24	276.98	6,536.51	6,541.43	0.00	0.00	0.00
14,400.00	89.80	89.88	7,278.59	277.19	6,636.50	6,641.41	0.00	0.00	0.00
14,500.00	89.80	89.88	7,278.94	277.41	6,736.50	6,741.38	0.00	0.00	0.00
14,600.00	89.80	89.88	7,279.30	277.62	6,836.50	6,841.35	0.00	0.00	0.00
14,700.00	89.80	89.88	7,279.65	277.83	6,936.50	6,941.32	0.00	0.00	0.00
14,800.00	89.80	89.88	7,280.00	278.04	7,036.50	7,041.29	0.00	0.00	0.00
14,900.00	89.80	89.88	7,280.35	278.25	7,136.50	7,141.27	0.00	0.00	0.00
15,000.00	89.80	89.88	7,280.71	278.46	7,236.50	7,241.24	0.00	0.00	0.00
15,100.00	89.80	89.88	7,281.06	278.67	7,336.50	7,341.21	0.00	0.00	0.00
15,200.00	89.80	89.88	7,281.41	278.88	7,436.50	7,441.18	0.00	0.00	0.00
15,300.00	89.80	89.88	7,281.77	279.09	7,536.50	7,541.16	0.00	0.00	0.00
15,400.00	89.80	89.88	7,282.12	279.30	7,636.50	7,641.13	0.00	0.00	0.00
15,500.00	89.80	89.88	7,282.47	279.51	7,736.50	7,741.10	0.00	0.00	0.00
15,600.00	89.80	89.88	7,282.82	279.72	7,836.49	7,841.07	0.00	0.00	0.00



Planning Report



Database:	Grand Junction District	Local Co-ordinate Reference:	Well NEBU 605 1H
Company:	B.P.	TVD Reference:	GL 6471' & RKB 25' @ 6496.00usft (Aztec 1000)
Project:	San Juan County, NM NAD83	MD Reference:	GL 6471' & RKB 25' @ 6496.00usft (Aztec 1000)
Site:	NEBU 605 Pad	North Reference:	Grid
Well:	NEBU 605 1H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Lateral Re-Drill		
Design:	Plan #2		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
15,700.00	89.80	89.88	7,283.18	279.94	7,936.49	7,941.04	0.00	0.00	0.00
15,800.00	89.80	89.88	7,283.53	280.15	8,036.49	8,041.02	0.00	0.00	0.00
15,900.00	89.80	89.88	7,283.88	280.36	8,136.49	8,140.99	0.00	0.00	0.00
16,000.00	89.80	89.88	7,284.23	280.57	8,236.49	8,240.96	0.00	0.00	0.00
16,100.00	89.80	89.88	7,284.59	280.78	8,336.49	8,340.93	0.00	0.00	0.00
16,200.00	89.80	89.88	7,284.94	280.99	8,436.49	8,440.91	0.00	0.00	0.00
16,300.00	89.80	89.88	7,285.29	281.20	8,536.49	8,540.88	0.00	0.00	0.00
16,400.00	89.80	89.88	7,285.65	281.41	8,636.49	8,640.85	0.00	0.00	0.00
16,500.00	89.80	89.88	7,286.00	281.62	8,736.49	8,740.82	0.00	0.00	0.00
16,600.00	89.80	89.88	7,286.35	281.83	8,836.49	8,840.79	0.00	0.00	0.00
16,700.00	89.80	89.88	7,286.70	282.04	8,936.49	8,940.77	0.00	0.00	0.00
16,800.00	89.80	89.88	7,287.06	282.25	9,036.48	9,040.74	0.00	0.00	0.00
16,900.00	89.80	89.88	7,287.41	282.46	9,136.48	9,140.71	0.00	0.00	0.00
17,000.00	89.80	89.88	7,287.76	282.68	9,236.48	9,240.68	0.00	0.00	0.00
17,100.00	89.80	89.88	7,288.12	282.89	9,336.48	9,340.66	0.00	0.00	0.00
17,200.00	89.80	89.88	7,288.47	283.10	9,436.48	9,440.63	0.00	0.00	0.00
17,300.00	89.80	89.88	7,288.82	283.31	9,536.48	9,540.60	0.00	0.00	0.00
17,400.00	89.80	89.88	7,289.17	283.52	9,636.48	9,640.57	0.00	0.00	0.00
17,500.00	89.80	89.88	7,289.53	283.73	9,736.48	9,740.54	0.00	0.00	0.00
17,600.00	89.80	89.88	7,289.88	283.94	9,836.48	9,840.52	0.00	0.00	0.00
17,700.00	89.80	89.88	7,290.23	284.15	9,936.48	9,940.49	0.00	0.00	0.00
17,800.00	89.80	89.88	7,290.59	284.36	10,036.48	10,040.46	0.00	0.00	0.00
17,900.00	89.80	89.88	7,290.94	284.57	10,136.48	10,140.43	0.00	0.00	0.00
18,000.00	89.80	89.88	7,291.29	284.78	10,236.47	10,240.41	0.00	0.00	0.00
18,100.00	89.80	89.88	7,291.64	284.99	10,336.47	10,340.38	0.00	0.00	0.00
18,200.00	89.80	89.88	7,292.00	285.21	10,436.47	10,440.35	0.00	0.00	0.00
18,300.00	89.80	89.88	7,292.35	285.42	10,536.47	10,540.32	0.00	0.00	0.00
18,400.00	89.80	89.88	7,292.70	285.63	10,636.47	10,640.29	0.00	0.00	0.00
18,500.00	89.80	89.88	7,293.05	285.84	10,736.47	10,740.27	0.00	0.00	0.00
18,600.00	89.80	89.88	7,293.41	286.05	10,836.47	10,840.24	0.00	0.00	0.00
18,700.00	89.80	89.88	7,293.76	286.26	10,936.47	10,940.21	0.00	0.00	0.00
18,800.00	89.80	89.88	7,294.11	286.47	11,036.47	11,040.18	0.00	0.00	0.00
18,851.42	89.80	89.88	7,294.29	286.58	11,087.88	11,091.58	0.00	0.00	0.00
605 1H RD Last Prod									
18,900.00	89.80	89.88	7,294.47	286.68	11,136.47	11,140.16	0.00	0.00	0.00
19,000.00	89.80	89.88	7,294.82	286.89	11,236.47	11,240.13	0.00	0.00	0.00
19,051.42	89.80	89.88	7,295.00	287.00	11,287.88	11,291.53	0.00	0.00	0.00
605 1H RD BHL									



Database:	Grand Junction District	Local Co-ordinate Reference:	Well NEBU 605 1H
Company:	B.P.	TVD Reference:	GL 6471' & RKB 25' @ 6496.00usft (Aztec 1000)
Project:	San Juan County, NM NAD83	MD Reference:	GL 6471' & RKB 25' @ 6496.00usft (Aztec 1000)
Site:	NEBU 605 Pad	North Reference:	Grid
Well:	NEBU 605 1H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Lateral Re-Drill		
Design:	Plan #2		

Design Targets									
Target Name									
- hit/miss target	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- Shape	(°)	(°)	(usft)	(usft)	(usft)	(usft)	(usft)		
605 1H First Prod	0.00	0.00	7,255.00	263.10	-147.21	2,150,235.34	2,810,438.14	36.9087135	-107.5345671
- plan misses target center by 7.77usft at 7616.61usft MD (7247.48 TVD, 261.28 N, -146.42 E)									
- Point									
605 1H LP	0.00	0.00	7,255.00	263.10	-49.95	2,150,235.34	2,810,535.40	36.9087127	-107.5342344
- plan hits target center									
- Point									
605 1H RD BHL	0.00	0.00	7,295.00	287.00	11,287.88	2,150,259.24	2,821,873.23	36.9086744	-107.4954540
- plan hits target center									
- Point									
605 1H RD Last Prod	0.00	0.00	7,295.00	286.58	11,087.88	2,150,258.82	2,821,673.23	36.9086752	-107.4961381
- plan misses target center by 0.71usft at 18851.42usft MD (7294.29 TVD, 286.58 N, 11087.88 E)									
- Point									

**Attachment to Application for Permit to Drill.
Drilling program**

**BP America Production Company
US Lower 48 Onshore
200 Energy Court
Farmington, NM 87401**

NEBU 605 Com #1H
Mancos Horizontal Development Well
Surface Location: 440' FSL & 805' FEL
Section 11, T31N, R07W
GL Elevation = 6470.81'
Lat. = 36.90798961°N
Long. = 107.53406636°W
NAD83
San Juan County, New Mexico

Proposed Bottom Hole Location Lateral: 700' FSL – 50' FEL
Section 07, T31N, R06W
San Juan County, New Mexico

Drilling program written in compliance with onshore Oil and Gas
Order No. 1

(III.D.3, effective May 2007) and Onshore Order No. 2 Dated November 18, 1988

SECTION – 1 – GEOLOGIC FORMATIONS AND CONTENTS

Marker	TVD	MD	Comments	BHP PSI/FT
Tertiary/San Jose Ss	25	25	Wet/aquifer	0.43
Ojo Alamo Ss	2,331	2,331	Wet/aquifer	0.43
Kirtland (Top/Cretaceous)	2,446	2,446	Gas & water-bearing	0.43
Fruitland	2,971	2,971	Gas & water-bearing	0.15
Lemon coal zone	3,146	3,146	Gas & water-bearing	0.07
Ignacio coal zone	3,186	3,186	Gas & water-bearing	0.07
Cotton Wood Coal	3,241	3,241	Gas & water-bearing	0.07
Pictured Cliff Ss	3,301	3,301	Wet	0.12
Cliffhouse Ss	5,381	5,447	Gas- & water-bearing	0.35
Mancos sh	6,136	6,226	Gas-bearing	0.43
TD – Lateral - Mancos	7,023	18,800	Gas-bearing	0.43
TD – Lateral - Mancos	7,295	19,051	Gas-bearing	0.43

Possible Aquifers: San Jose and Ojo Alamo

Oil Shale: None Expected.

Oil & Gas: Primary objective is the Mancos formation from 7,023' TVD (landing point) to 7,023' TVD (toe). SUNDRY: Landing point in Mancos is 7,255' TVD and to will be 7,295' TVD.

Protection of oil, gas, water, or other mineral bearing formations: Protection shall be accomplished by setting surface casing below base of possible aquifer and cementing surface casing to surface.

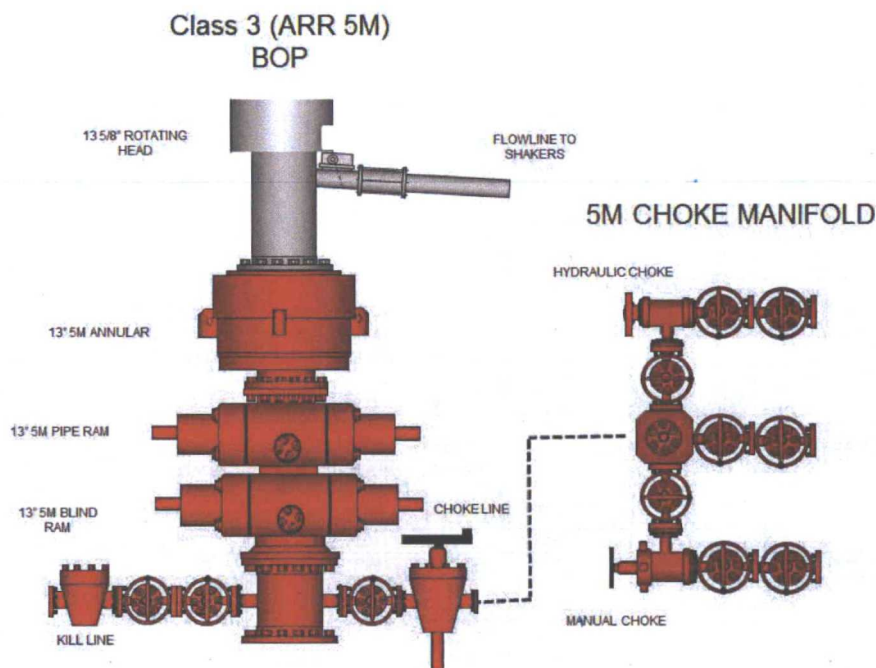
SECTION – 2 BOPE

BOP equipment and accessories will meet or exceed BLM requirements outlined in 43 CFR Part 3160.

A 13 5/8" 5M BOPE will be utilized to drill this well. Maximum anticipated surface pressure for 13 5/8" 5M BOPE is 1,500 psi. The 13 5/8" BOPE will be tested 250 psi (Low) for 5 minutes and 5000 psi (High) for 10 minutes if isolated by test plug or 70 percent of internal yield pressure of casing if BOP stack is not isolated from casing. Pressure test conductor, surface, and intermediate casing(s) to 1500 psi for 30 minutes. All preventers and surface casing will be tested before drilling out of surface casing. BOP equipment will be tested every 30 days, after any repairs are made to the BOP equipment, and after the BOP equipment is subjected to pressure. Annular preventers will be functionally operated at least once per week. Pipe rams will be activated daily and blind rams shall be activated each trip or at least weekly. The New Mexico Oil & Gas Conservation Commission and the BLM will be notified 24 hours in advance of testing of BOPE.

	BHP	MASP
13 5/8" 5M BOPE	7,295 TVD	3,136
		1,1531

13-5/8" BOPE



SECTION – 3 Casing

Bit Program

26" Conductor Hole = Surface to 120'
 17 1/2" Surface Hole = 120' to 1,000'
 12 1/4" Intermediate Hole = 1,000' to 6,315'
 8 3/4" Curve/Lateral = 6,008' MD to 19,051' MD

Casing Program – all casing stings are new casing

Type	Casing & Hole Size	Weight	Grade	Coupling	Setting Depth (MD)	Comments
Conductor	20" (26")	94 ppf	J55	BT&C	0' - 120'	New casing. Conductor Casing maybe preset. Will be cemented to surface
Surface	13-3/8" (17-1/2")	54.5 ppf	J-55	BT&C	0' - 1,000'	New Casing. Surface Casing maybe preset
Intermediate	9-5/8" (12-1/4")	40 ppf	P110HC	BT&C	0' - 6,305'	New Casing. Two Stage Cement to surface
Production Liner	5-1/2" (8-3/4")	20 ppf	P-110	GBCD	5,850'(Liner top) - 19,051'	New Casing – Single Stage Cement to overlap previous casing shoe

NOTE: Whipstock set in 9-5/8", 40#, P110HC, BTC will be placed from 6008' to 6027', it will be placed on top of a cast iron bridge plug set from 6027' to 6030'.

	Collapse	Burst	Tension
Min Safety Factors	1.125	1.100	1.400

	Casing Depth	MW in	MW out	Pres in	Pres out	SF	
Collapse	120	0	8.33	0	52	10.00	
Burst	120	8.3	0	1500	0	1.41	1500psi casing test
		Mud Wt	Air Wt	Bouy Wt	BW +100k		
Tension (Pipe Body)	120	9.0	11,280	9,730	109,730	13.49	
Tension (Connection)	120	9.0	11,280	9,730	109,730	12.78	
	BF= 1- (MW)/65.5 = 0.8626						100k over pull

	Collapse	Burst	Tension
Min Safety Factors	1.125	1.100	1.400

	Casing Depth	MW in	MW out	Pres in	Pres out	SF	
Collapse	1000	0	15.80	0	822	1.38	Full evacuation with 15.8ppg cement in the annulus
Burst	1000	9.0	0	1500	0	1.83	1500psi casing test
Tension (Pipe Body)	1000	Mud Wt 9.0	Air Wt 54,000	Bouy Wt 46,580	BW +100k 146,580	5.82	100k over pull
Tension (Connection)	1000	9.0	54,000	46,580	146,580	6.20	
	$BF = 1 - (MW)/65.5 = 0.8626$						

	Collapse	Burst	Tension
Min Safety Factors	1.125	1.100	1.400

	Casing Depth TVD	MW in	MW out	Pres in	Pres out	SF	
Collapse	6606	0.00	10.00	0	3435	1.23	Full evacuation with 10 ppg mud outside
Burst	6606	9.0	0	1500	0	5.27	1500 psi casing test
Tension (Pipe Body)	6606	Mud Wt 9.0	Air Wt 264,240	Bouy Wt 227,932	BW +100k 327,932	3.84	100k over pull
Tension (Connection)	6606	9.0	264,240	227,932	327,932	3.86	
	BF= 1- (MW)/65.5 = 0.8626						

Production Casing Design - Evacuation/Casing Test (collapse & burst), 100k overpull (tension)								
Min Safety Factors:					Collapse	Burst	Tension	
					1.125	1.100	1.400	
	Size	Weight	Grade	Conn	Collapse	Burst	Tension (Pipe Body)	Tension (Connection) Notes
Production	5.5	20	P110	GBCD	13,300	10,640	546,000	568,000
					80% of Burst =		8,512	
	Casing Depth TVD	MW in	MW out	Pres in	Pres out	SF		
Collapse	7295	0.00	13.30	0	5045	2.64	Full evacuation with 13.3 ppg cement in the annulus	
Burst	7295	9.0	0	1500	0	7.09	1500 psi casing test	
		Mud Wt	Air Wt	Bouy Wt	BW +100k			
Tension (Pipe Body)	7295	9.0	145,900	125,853	225,853	2.42	100k over pull	
Tension (Connection)	7295	9.0	145,900	125,853	225,853	2.51		
BF= 1- (MW)/65.5 = 0.8626								

All casing strings including conductor casing will be tested to .22 psi per foot of casing string length or 1500 psi, whichever is greater, but not to exceed 70% of the minimum internal yield.

Minimum casing design factors used:

Collapse -	1.125
Burst -	1.1
Jt. Strength -	1.40

Surface Casing – Centralizers shall be placed on the first 4 (bottom 4) joints of casing (1 per joint) and 1 every 3rd joint to surface.

Intermediate casing – Centralizers shall be placed on first 3 (bottom 3) joints of casing (1 per joint) and 1 every 3rd joint to surface. DV tool will be placed at +/- 2,400' MD.

Production Liner String – Centralizers will be placed at discretion in lateral to achieve adequate standoff for quality cement job. A toe sleeve will be placed 2 joints above shoe track.

NOTE: Use of DV tool would be considered by operator as back up in case we experience heavy losses and are concerned with cement not reaching surface. If major losses are not encountered we will not run DV tool.

*Surface casing maybe preset with a preset rig.

SECTION – 4 Cement

The proposed cementing program has been designed to protect and/or isolate all usable water zones, potentially productive zones, lost circulation zones, abnormally pressured zones, and any prospectively valuable deposits of minerals. Any isolating medium other than cement shall receive approval prior to use. The casing setting depth shall be calculated to position the casing seat opposite a competent formation which will contain the maximum pressure to which it will be exposed during normal drilling operations. All indications of useable water shall be reported.

- Pea Gravel or other material shall not be used to fill up around the conductor casing or surface casing in the event cement fall back occurs.
- The conductor casing and surface casing shall in all cases be cemented back to surface. In the event cement does not circulate to surface or fall back of the cement column occurs, remedial cementing shall be done to cement the casing back to surface. No more than the top 100' will be remediated with 1" line if fall back occurs. Anything more than 100' will require plan approval to remediate.

- Top plugs shall be used to reduce contamination of cement by displacement fluid. A bottom plug or other acceptable technique, such as a pre-flush fluid, inner string cement method, etc. shall be utilized to help isolate the cement from contamination by the mud fluid being displaced ahead of the cement slurry.
- Cement Volumes may be adjusted based on hole conditions.

Conductor Casing Single Stage Job – (0-120' MD/TVD): 27" hole x 20" casing – 100% XS

Cement will be circulated to surface with 367 sx of Class G cement, 15.8 ppg, 1.174 ft³/sk, 94 lbm/sk, 2% CaCl, 0.1250 lbm/sk Poly E Flake, 5.13 Gal/sk fresh water. Volume 430 ft³

Surface Casing Single Stage Job – (0-1,000' MD/TVD): 17-1/2" hole x 13-3/8" casing – 50% XS

Cement will be circulated to surface with 753 sx of Class G cement, 15.8 ppg, 1.174 ft³/sk, 94 lbm/sk, 2% CaCl, 0.1250 lbm/sk Poly E Flake, 5.13 Gal/sk fresh water. Volume 884 ft³

Intermediate Casing – Two Stage (0-6,305' MD/6,200' TVD): 12-1/4" (1,000' to 6,700') hole x 9-5/8" casing with DV tool @ +/- 2,400' MD. Use of DV tool would be considered by operator as back up in case we experience heavy losses and are concerned with cement not reaching surface.

Cement will be circulated to surface. Stage 1 Lead – 1075 sx of Poz 12.3 ppg, 1.958 ft³/sk, 61.10 lbm/sk, 0.1250 lbm/sk Poly E Flake, 10.42 Gal/sk fresh water. Tail – 220 sx 15.8 ppg, 1.147 ft³/sk, 94 lbm/sk, 0.10% Halad, 0.150 lbm/sk Poly E Flake, 4.96 Gal/sk freshwater. Stage 2 Lead – 1225 sx of Poz 12.3 ppg, 2.005 ft³/sk, 61.10 lbm/sk, 2% CaCl, 0.1250 lbm/sk Poly E Flake, 10.74 Gal/sk. Tail – 270 sx 15.8 ppg, 1.147 ft³/sk, 94 lbm/sk, 4.99 Gal/sk. Volume 5,079 ft³

Production Casing Liner – Single Stage Conventional Cement (0' - 19,051' MD/ 7,295' TVD) 8-3/4" hole x 5-1/2" casing:

Estimated top of cement at 5,850' MD. 2875 sx of Class G cement, 13.3 ppg, 1.136 ft³/sk, 94 lbm/sk, 2% CaCl, 0.1250 lbm/sk Poly E Flake, 6.08 Gal/sk fresh water, Volume 3266 ft³

Cement calculations are used for volume estimation. Well conditions will dictate final cement job design.

Actual volumes will be calculated and determined by conditions onsite. All cement slurries will meet or exceed minimum BLM and New Mexico Oil Conservation Division requirements. Slurries used will be the slurries listed above or equivalent slurries depending on service provider selected. Cement yields may change depending on slurries selected.

All waiting on cement times shall be a minimum of 8 hours or adequate to achieve a minimum of 500 psi compressive strength at the casing shoe prior to drilling out.

SECTION – 5 Circulating Medium (Mud Program)

CLOSED-LOOP SYSTEM DESIGN PLAN

The closed-loop system will consist of a series of temporary above-ground storage tanks and/or haul-off bins suitable for holding the cuttings and fluids from drilling operations. The closed-loop system will not entail temporary pits, below-grade storage tanks, below-grade sumps, or drying pads.

Design considerations include:

- The closed-loop system will be signed in accordance with 19.15.17.11 NMAC.
- The closed-loop system storage tanks will be of adequate volume to ensure confinement of all fluids and provide sufficient freeboard to prevent uncontrolled releases.

- Topsoil will be salvaged and stored for use in reclamation activities.

CLOSED-LOOP SYSTEM OPERATING & MAINTENANCE PLAN

The closed-loop system will be operated and maintained to contain liquids and solids; minimize the amount of drilling fluids and cuttings that require disposal; maximize the amount of drilling fluid recycled and reused in the drilling process; isolate drilling wastes from the environment; prevent contamination of fresh water; and protect public health and the environment.

Operation and maintenance considerations include:

- Fluid levels will be maintained to provide sufficient freeboard to prevent over-topping.
- Visual inspections will be conducted on a daily basis to identify any potential leaks and to ensure that the closed-loop system storage tanks have sufficient freeboard to prevent over-topping.
- Only drilling fluids or cuttings intrinsic to, used by, or generated from, drilling operations will be stored in the closed-loop system storage tanks. Hazardous waste, miscellaneous solid waste, and/or debris will not be stored in the storage tanks.
- The OCD District Office will be notified within 48 hours of discovery of a leak in the closed-loop drilling system. If a leak is discovered, all liquid will be removed within 48 hours and the damage repaired.

CLOSED-LOOP SYSTEM CLOSURE PLAN

The closed-loop system will be closed in accordance with 19.15.17.13 NMAC. Closure considerations include:

- Drilling fluids will be recycled and transferred to other permitted closed-loop systems or returned to the vendor for reuse, as practical.
- Residual fluids will be pulled from the storage tanks, mixed with saw dust or similar absorbent material, and disposed of at Industrial Envirotech, Inc. waste disposal facilities.
- Remaining cuttings or sludges will be vacuumed from the storage tanks and disposed of at the Envirotech, Inc and/or Industrial Ecosystem, Inc. waste disposal facilities.
- Storage tanks will be removed from the well location during the rig move.
- The well pad will be reclaimed and seeded in accordance with subsections G, Hand I of 19.15.17.13NMAC.

Mud Tables

Interval (MD)	Hole Section	Hole Size	Type	MW	FL	PV	YP	PH	REMARKS
0'-120'	Conductor	27"	FW/Gel	8.4	NC	8	12	9.0	Spud Mud
0'-1,000'	Surface	17-1/2"	FW/Gel	8.4	NC	8	12	9.0	Spud Mud
1,000'-6,315'	Intermediate	12-1/4"	LSND	8.6-10.0	<8	4-6	12-15	10.0	Fresh Water
6,008'-19,051'	Production	8-3/4"	LSND	9.0-13.0	<8	14-20	8-14	11.0	Fresh Water

Contingency

Interval (MD)	Hole Section	Hole Size	Type	MW	FL	PV	YP	PH	REMARKS
1,000'-6,315'	Intermediate	12-1/4"	Aerated Fluid	7.5-9.0	<8	4-6	12-15	10.0	Fresh water w/ air
6,008'-19,051'	Production	8-3/4"	OBM	9.0-13.0	<8	14-20	8-14	11.0	OBM

Sufficient weighting material will be on hand to weight mud up to 1 PPG over, if required.

The formula for weight up with barite is listed below:

$$\text{Sacks of Barite per 100 bbl of mud} = 1470 \times (W2 - W1) \div (35 - W2)$$

Where; W1 = current mud weight

W2 = new mud weight

$$\text{Sacks} = 1470 \times (10 - 9) / (35 - 10) = 59 \text{ sx} \times 5 \text{ (500bbls minimum)} = 294 \text{sx}$$

Pason Pit Volume Totalizer (PVT) equipment (or equivalent) will be on each pit to monitor pit levels. A trip tank equipped with a Pason PVT will be used to monitor trip volumes.

A closed-loop system will be used to recover drilling fluid and dry cuttings in both phases of the well and on all hole intervals, including fresh water and oil-based operations. Above-ground tanks will be utilized to hold cuttings and fluids for rig operations. A frac tank will be on location to store fresh water. Waste will be disposed of properly at an EPA-approved hazardous waste facility. Fresh water cuttings will be disposed of as outlined in surface use plan location will be lined in accordance with the Surface Use Plan of Operations.

SECTION – 6 Test, Logging & Coring

Testing: None planned.

Logging:

Azimuthal and Radial GR – Drilling curve and lateral

Directional from surface shoe to TD

Mud Logging:

Geologist & a manned mud-logging unit will be operational @ +/- 3,000' to TD of pilot and lateral.

Gas detecting equipment shall be installed in the mud return system for exploratory wells and hydrocarbon gas shall be monitored for pore pressure changes from base of surface casing to TD.

Visual mud monitoring equipment shall be in place to detect volume changes indicating loss or gain of circulating fluid volume.

Coring: None

Cement Bond Log:

BP will run a cement bond log (CBL) if cement returns are not observed on the surface and first intermediate casing strings. The CBL will confirm the quality of cement and the actual top of cement.

SECTION – 7 Pressure

Normal to subnormal pressure gradient to TD.

MASP and casing design parameters determined using 0.43 psi/ft.

Maximum expected BHP @ 7,295' TVD: 3,136psi

Maximum expected BHT @ 7,295' TVD: ~200° F

Possible lost circulation in the Fruitland Coal to Cliffhouse (~3,000' to 5,000'). Lost circulation has been successfully mitigated with lost circulation materials in concentrations of up to 30% by volume. Intermediate casing will be set through this interval to +/- 6,305'.

No hydrogen sulfide gas is anticipated, however, if H₂S is encountered, the guidelines in Onshore Order No. 6 will be followed.

Directional Plans: Horizontal directional well, directional plans attached. Lateral KOP subject to change based on mud log evaluation.

Completion:

- **Pressure test**
 - Pressure test production casing to allowable frac pressure or as per BLM requirements
- **Stimulation**
 - well will be stimulated with approximately 35,000,000 pound of proppant in 775,000 bbls of water; the number of stages and the amount of proppant will be adjusted based on the petrophysical properties of the target zone
 - stages will be isolated with plugs
 - plugs will be drilled out
 - flowback well
- **Turn well to production**
 - It is intended to produce the well up the casing, without installing tubing, for at least 120 days or until tubing is needed to unload the well

Timing: BP plans to drill this well in March, 2018

It is anticipated that the drilling of this well will take approximately 30 days.

It is anticipated that completion operations will begin immediately after the well has been drilled depending on stimulation company availability.