

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.
NMNM03358

6. If Indian, Allottee or Tribe Name

7. If Unit or CA/Agreement, Name and/or No.

8. Well Name and No.
NEBU 604 COM 3H9. API Well No.
30-045-35829-00-X110. Field and Pool or Exploratory Area
BASIN MANCOS

11. County or Parish, State

SAN JUAN COUNTY, NM

SUBMIT IN TRIPLICATE - Other instructions on page 2

1. Type of Well

☐ Oil Well ☒ Gas Well ☐ Other

2. Name of Operator

BP AMERICA PRODUCTION COMPANY

Contact: TOYA COLVIN

Email: Toya.Colvin@bp.com

3a. Address

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

3b. Phone No. (include area code)

Ph: 281.892.5369

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

Sec 13 T31N R7W SWNW 1910FNL 587FWL
36.901531 N Lat, 107.529266 W Lon**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.

Please see the attached proposal to change the wellbore for the subject well. Should you have further questions/concerns regarding this change please contact Steven Herrin at 281-892-4303 or Steven.Herrin@bp.com

Updated drill plan, plats and wellbore diagram attached.

OIL CONS. DIV DIST. 3
AUG 10 2017**ADHERE TO PREVIOUS NMOC**
CONDITIONS OF APPROVAL

14. I hereby certify that the foregoing is true and correct.	
Electronic Submission #382341 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 08/03/2017 (17JWS0196SE)	
Name (Printed/Typed) TOYA COLVIN	Title REGULATORY ANALYST
Signature (Electronic Submission)	Date 07/25/2017

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved By JACK SAVAGE	Title PETROLEUM ENGINEER	Date 08/03/2017
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 **

NMOC

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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 30-045-35829	² Pool Code 97232	³ Pool Name <i>Basin</i> Mancos Gas
⁴ Property Code 317305	⁵ Property Name Northeast Blanco Unit 604 Com	⁶ Well Number 3H
⁷ OGRID No. 000778	⁸ Operator Name BP America Production Company	⁹ Elevation 6500

¹⁰ Surface Location

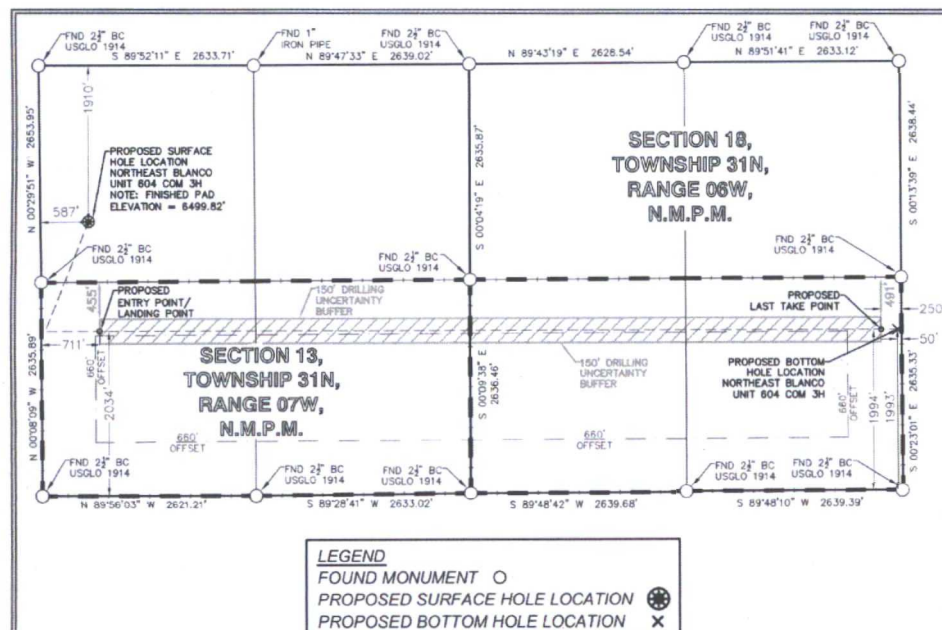
UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
E	13	31N	07W		1910	North	587	West	San Juan

¹¹ 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
I	18	31N	06W		1993	South	50	East	San Juan

¹² Dedicated Acres 640.00 S/2 - SEC. 13 S/2 - SEC. 18	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.



¹⁷ 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 unleased 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.

Toya Colvin 7/19/17
Signature Date

Toya Colvin

Printed Name

toya.colvin@bp.com

E-mail Address

¹⁸ 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.

7-22-16
Date of Survey

Signature and Seal of Professional Surveyor

17078
Certificate Number



NEBU 604 COM 3H	NWZ NAD'83	NAD'83	TIES
PROPOSED SURFACE HOLE LOCATION (SHL)	N (Y) = 2,147,625.75' E (X) = 2,811,995.18'	LAT. = 36.90153217°N LON. = 107.52926976°W	FNL = 1910' FWL = 587'
PROPOSED ENTRY POINT (EP)/LANDING POINT (LP)	N (Y) = 2,146,280.36' E (X) = 2,812,126.99'	LAT. = 36.89783558°N LON. = 107.52883364°W	FSL = 2304' FWL = 711'
PROPOSED LAST TAKE POINT (LTP)	N (Y) = 2,146,278.87' E (X) = 2,821,690.43'	LAT. = 36.89774317°N LON. = 107.49612730°W	FSL = 1994' FEL = 250'
PROPOSED BOTTOM HOLE LOCATION (BHL)	N (Y) = 2,146,278.83' E (X) = 2,821,890.43'	LAT. = 36.89774112°N LON. = 107.49544332°W	FSL = 1993' FEL = 50'

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

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

NEBU 604 Com #3H
Mancos Horizontal Development Well
Surface Location: 1910' FNL & 587' FWL
Section 13, T31N, R07W
GL Elevation = 6499.82'
Lat. = 36.90153217°N
Long. = 107.52926976°W
NAD83
San Juan County, New Mexico

Proposed Bottom Hole Location Lateral: 1993' FSL – 50' FEL
Section 18, 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	2,385	2,427	Wet/aquifer	0.43
Kirtland (Top/Cretaceous)	2,505	2,554	Gas & water-bearing	0.43
Fruitland	3,000	3,076	Gas & water-bearing	0.15
Lemon coal zone	3,195	3,282	Gas & water-bearing	0.07
Ignacio coal zone	3,240	3,330	Gas & water-bearing	0.07
Cotton Wood Coal	3,315	3,409	Gas & water-bearing	0.07
Pictured Cliff Ss	3,335	3,430	Wet	0.12
Cliffhouse Ss	5,415	5,620	Gas- & water-bearing	0.35
Mancos sh	6,175	6,390	Gas-bearing	0.43
TD	7,107	17,420	Gas-bearing	0.43

Possible Aquifers: San Jose and Ojo Alamo

Oil Shale: None Expected.

Oil & Gas: Primary objective is the Mancos formation from 7,107' TVD (landing point) to 7,147' TVD (toe).

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.

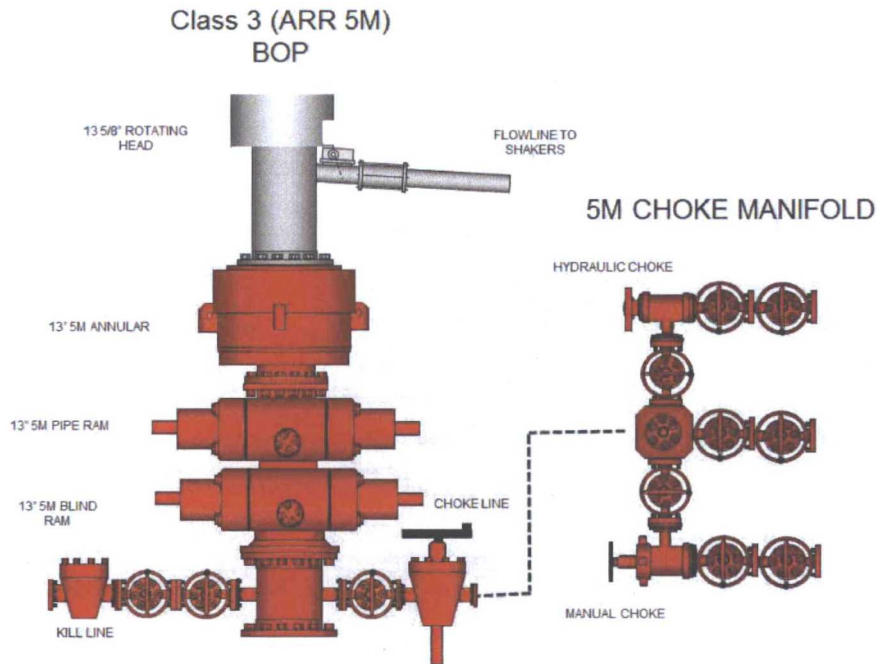
SECTION – 2 BOPE

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
		3,073	1,500
13 5/8" 5M BOPE	7,147 TVD		

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 7,500' KOP @ 6575' MD
 8 3/4" Lateral = 7,500' MD to 17,420' MD

Casing Program – all casing strings 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' - 7,500'	New Casing. Two Stage Cement to surface
Production	5-1/2" (8-3/4")	20 ppf	P-110	GBCD	0' - 17,420'	New Casing – Single Stage Cement to overlap previous casing shoe

Design Factor Table

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

Min Safety Factors				Collapse	Burst	Tension		
				1.125	1.100	1.400		
Conductor	Size	Weight	Grade	Conn	Collapse	Burst	Tension (Pipe Body)	Notes
	20	94	J55	BTC	520	2,110	1,480,000	1,402,000
				80% of Burst = 1,698				

	Casing Depth	MW in	MW out	PES in	PES out	SP
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

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

	Min Safety Factors			Tension		
	Collapse	Burst	Tension		Burst	Tension
	1.125	1.100	1.400			
	Size	Weight	Grade	Conn	Collapse	Tension (Pipe Body)
Surface	13.375	54	K55	BTC	1,130	853,000
					2,740	909,000
					80% of Burst = 2,192	

	Casing Depth	MW in	MW out	Pies in	Pies out	SF
Collapse	1000	0	15.80	0	822	1.38
Burst	1000	9.0	0	1500	0	1.83
Tension (Pipe Body)	1000	9.0	Air Wt 54,000	Bouy Wt 46,580	BW +100k 146,580	5.82
Tension (Connection)	1000	9.0	54,000	46,580	146,580	6.20

Full evacuation with 15.8ppg cement in the annulus
1500psi casing test
100k over pull

$BF = 1 - (MW)/65.5 = 0.8626$

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

[illegible]

	Casing Depth TVD	MW in	MW out	PRES in	PRES out	SR
Collapse	7060	0.00	10.00	0	3671	1.15
Burst	7060	9.0	0	1500	0	5.27
		Mud Wt	Air Wt	Bouy Wt	BW +100k	
Tension (Pipe Body)	7060	9.0	282,400	243,597	343,597	3.67
Tension (Connection)	7060	9.0	282,400	243,597	343,597	3.68
		BF = 1 - (MW)/65.5 = 0.8626				

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)	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	7147	0.00	13.30	0	4943	2.69	Full evacuation with 13.3 ppg cement in the annulus		
Burst	7147	9.0	0	1500	0	7.09	1500 psi casing test		
		Mud Wt	Air Wt	Bouy Wt	BW +100k				
Tension (Pipe Body)	7147	9.0	142,940	123,299	223,299	2.45	100k over pull		
Tension (Connection)	7147	9.0	142,940	123,299	223,299	2.54			
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 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 – 100% 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 (0-7,500' MD/7,060' TVD): 12-1/4" (1,000' to 7,500') 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 – Single Stage Conventional Cement (0' - 17,420' MD/ 7,147' TVD) 8-3/4" hole x 5-1/2" casing:

Estimated top of cement at 6,400' MD. 1650 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 1921 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 19.15.17.13 NMAC.

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'-7,500'	Intermediate	12-1/4"	LSND	8.6-10.0	<8	4-6	12-15	10.0	Fresh Water
7,500'-17,420'	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' - 7,500'	Intermediate	12-1/4"	Aerated Fluid	7.5-9.0	<8	4-6	12-15	10.0	Fresh water w/ air
7,500'-17,420'	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

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

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 is surface use plane 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 CBL on the production casing since we are not bringing cement back to surface.

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 @ 7,147' TVD: 3,073 psi

Maximum expected BHT @ 7,147' TVD: ~220° 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 +/- 7,500'.

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 OH logs 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 60 days or until tubing is needed to unload the well

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

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

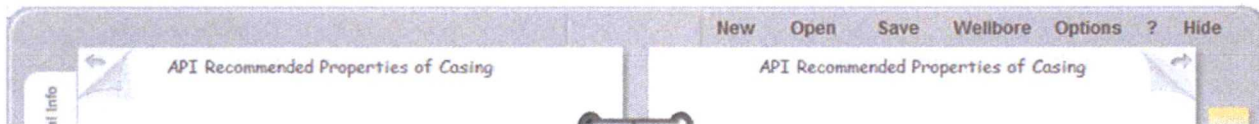
It is anticipated that completion operations will begin immediately after the well has been drilled depending on stimulation company availability.

Conductor 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)
Conductor	20	94	J55	BTC	520	2,110	1,480,000	1,402,000
					80% of Burst =		1,688	

	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	100k over pull
Tension (Connection)	120	9.0	11,280	9,730	109,730	12.78	
	BF= 1- (MW)/65.5 =		0.8626				

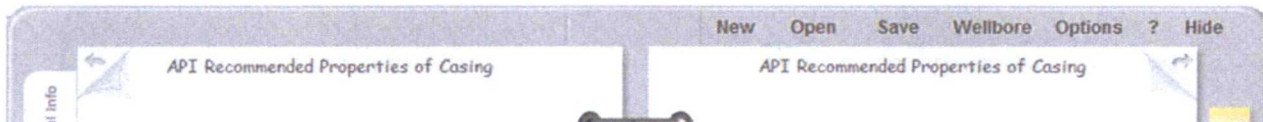


Surface Casing Design - Evacuation/Casing Test (collapse & burst), 100k overpull (tension)

	Collapse	Burst	Tension
Min Safety Factors	1.125	1.100	1.400

	Size	Weight	Grade	Conn	Collapse	Burst	Tension (Pipe Body)	Tension (Connection)
Surface	13.375	54	K55	BTC	1,130	2,740	853,000	909,000
					80% of Burst =	2,192		

	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 c
Burst	1000	9.0	0	1500	0	1.83	1500psi casing test
		Mud Wt	Air Wt	Bouy Wt	BW +100k		
Tension (Pipe Body)	1000	9.0	54,000	46,580	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				



Intermediate 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)
Intermediate	9.625	40	P110HC	BTC	4,230	7,910	1,260,000	1,266,000
					80% of Burst =	6,328		

	Casing Depth TVD	MW in	MW out	Pres in	Pres out	SF	
Collapse	7060	0.00	10.00	0	3671	1.15	Full evacuation with 10 ppg ml
Burst	7060	9.0	0	1500	0	5.27	1500 psi casing test
		Mud Wt	Air Wt	Bouy Wt	BW +100k		
Tension (Pipe Body)	7060	9.0	282,400	243,597	343,597	3.67	100k over pull
Tension (Connection)	7060	9.0	282,400	243,597	343,597	3.68	
	BF= 1- (MW)/65.5 =	0.8626					

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	7147	0.00	13.30	0	4943	2.69	Full evacuation with 13.3 ppg c annulus
Burst	7147	9.0	0	1500	0	7.09	1500 psi casing test
		Mud Wt	Air Wt	Bouy Wt	BW +100k		
Tension (Pipe Body)	7147	9.0	142,940	123,299	223,299	2.45	100k over pull
Tension (Connection)	7147	9.0	142,940	123,299	223,299	2.54	
	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 604 Pad
NEBU 604 COM 3H

OH
Plan #3

OIL CONS. DIV DIST. 3
AUG 21 2017

Anticollision Report

22 June, 2017



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Anticollision Report



Company:	B.P.	Local Co-ordinate Reference:	Well NEBU 604 COM 3H
Project:	San Juan County, NM NAD83	TVD Reference:	GL 6500' & RKB 25' @ 6525.00usft
Reference Site:	NEBU 604 Pad	MD Reference:	GL 6500' & RKB 25' @ 6525.00usft
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	NEBU 604 COM 3H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Grand Junction District
Reference Design:	Plan #3	Offset TVD Reference:	Reference Datum

Reference	Plan #3		
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	6/22/2017		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
0.00	17,420.53	Plan #3 (OH)	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 604 Pad						
NEBU 241 - OH - OH	16,591.44	3,550.00	3,511.32	3,396.12	30.478	CC
NEBU 241 - OH - OH	16,600.00	3,550.00	3,511.33	3,396.06	30.460	ES
NEBU 241 - OH - OH	17,420.53	3,550.00	3,607.88	3,484.98	29.357	SF
NEBU 311M - OH - OH	7,603.57	7,045.58	907.59	604.31	2.993	CC, ES, SF
NEBU 321N - OH - OH	16,682.70	100.00	6,938.38	6,857.06	85.328	CC
NEBU 321N - OH - OH	16,700.00	100.00	6,938.40	6,856.95	85.190	ES
NEBU 321N - OH - OH	17,420.53	100.00	6,977.50	6,890.21	79.939	SF
NEBU 498 - OH - OH	3,849.73	3,385.00	1,270.97	1,127.93	8.885	CC, ES
NEBU 498 - OH - OH	3,900.00	3,385.00	1,271.97	1,128.68	8.877	SF
NEBU 604 COM 2H - Lateral - Plan #4	1,000.00	1,000.00	19.99	17.89	9.488	CC, ES
NEBU 604 COM 2H - Lateral - Plan #4	17,420.53	17,242.24	1,325.20	809.08	2.568	SF
NEBU 604 COM 2H - Pilot - Plan #3	1,000.00	1,000.00	19.99	17.89	9.488	CC, ES
NEBU 604 COM 2H - Pilot - Plan #3	1,100.00	1,099.98	21.74	19.43	9.429	SF

Offset Design		NEBU 604 Pad - NEBU 241 - OH - OH										Offset Site Error:		0.00 usft
Survey Program:		100-UNKNOWN										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		
0.00	0.00	0.00	131.90	0.00	0.00	102.03	-1,935.04	9,080.41	9,285.24					
100.00	100.00	0.00	131.90	0.08	0.00	102.03	-1,935.04	9,080.41	9,284.35					
148.95	148.95	17.05	148.95	0.19	0.34	102.03	-1,935.04	9,080.41	9,284.30	9,283.76	0.54	N/A		
200.00	200.00	68.10	200.00	0.31	1.36	102.03	-1,935.04	9,080.41	9,284.30	9,282.63	1.67	5,555.744		
300.00	300.00	168.10	300.00	0.53	4.72	102.03	-1,935.04	9,080.41	9,284.30	9,279.04	5.26	1,765.808		
400.00	400.00	268.10	400.00	0.76	8.72	102.03	-1,935.04	9,080.41	9,284.30	9,274.82	9.48	979.089		
500.00	500.00	368.10	500.00	0.98	12.72	102.03	-1,935.04	9,080.41	9,284.30	9,270.59	13.71	677.323		
600.00	600.00	468.10	600.00	1.21	16.72	102.03	-1,935.04	9,080.41	9,284.30	9,266.37	17.93	517.747		
700.00	700.00	568.10	700.00	1.43	20.72	102.03	-1,935.04	9,080.41	9,284.30	9,262.14	22.16	419.026		
800.00	800.00	668.10	800.00	1.66	24.72	102.03	-1,935.04	9,080.41	9,284.30	9,257.92	26.38	351.923		
900.00	900.00	768.10	900.00	1.88	28.72	102.03	-1,935.04	9,080.41	9,284.30	9,253.69	30.61	303.345		
1,000.00	1,000.00	868.10	1,000.00	2.11	32.72	102.03	-1,935.04	9,080.41	9,284.30	9,249.47	34.83	266.551		
1,100.00	1,099.98	968.08	1,099.98	2.30	36.72	-99.56	-1,935.04	9,080.41	9,284.59	9,245.56	39.03	237.904		
1,200.00	1,199.84	1,067.94	1,199.84	2.48	40.72	-99.58	-1,935.04	9,080.41	9,285.46	9,242.26	43.20	214.958		
1,300.00	1,299.45	1,167.55	1,299.45	2.68	44.70	-99.60	-1,935.04	9,080.41	9,286.92	9,239.55	47.37	196.046		

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 604 COM 3H
Project:	San Juan County, NM NAD83	TVD Reference:	GL 6500' & RKB 25' @ 6525.00usft
Reference Site:	NEBU 604 Pad	MD Reference:	GL 6500' & RKB 25' @ 6525.00usft
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	NEBU 604 COM 3H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Grand Junction District
Reference Design:	Plan #3	Offset TVD Reference:	Reference Datum

Offset Design NEBU 604 Pad - NEBU 241 - OH - OH														Offset Site Error:	0.00 usft
Survey Program: 100-UNKNOWN														Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N-S (usft)	+E-W (usft)	Between Centres (usft)	Between Ellipses (usft)					
1,400.00	1,398.70	1,266.80	1,398.70	2.89	48.67	-99.63	-1,935.04	9,080.41	9,288.97	9,237.42	51.55	180.184			
1,500.00	1,497.47	1,365.57	1,497.47	3.14	52.62	-99.68	-1,935.04	9,080.41	9,291.63	9,235.88	55.75	166.681			
1,600.00	1,595.62	1,463.72	1,595.62	3.43	56.55	-99.73	-1,935.04	9,080.41	9,294.90	9,234.95	59.95	155.039			
1,700.00	1,693.06	1,561.16	1,693.06	3.77	60.45	-99.78	-1,935.04	9,080.41	9,298.81	9,234.63	64.18	144.895			
1,800.00	1,789.64	1,657.74	1,789.64	4.17	64.31	-99.84	-1,935.04	9,080.41	9,303.37	9,234.95	68.42	135.976			
1,900.00	1,885.27	1,753.37	1,885.27	4.63	68.13	-99.91	-1,935.04	9,080.41	9,308.61	9,235.93	72.68	128.074			
2,000.00	1,980.36	1,848.46	1,980.36	5.13	71.94	-100.09	-1,935.04	9,080.41	9,314.25	9,237.26	76.98	120.991			
2,100.00	2,075.46	1,943.56	2,075.46	5.66	75.74	-100.27	-1,935.04	9,080.41	9,319.99	9,238.68	81.31	114.626			
2,200.00	2,170.55	2,038.65	2,170.55	6.20	79.55	-100.44	-1,935.04	9,080.41	9,325.82	9,240.18	85.65	108.886			
2,300.00	2,265.65	2,133.75	2,265.65	6.76	83.35	-100.62	-1,935.04	9,080.41	9,331.76	9,241.76	90.00	103.686			
2,400.00	2,360.74	2,228.84	2,360.74	7.32	87.15	-100.80	-1,935.04	9,080.41	9,337.79	9,243.43	94.36	98.958			
2,500.00	2,455.84	2,323.94	2,455.84	7.90	90.96	-100.98	-1,935.04	9,080.41	9,343.93	9,245.20	98.73	94.641			
2,600.00	2,550.93	2,419.03	2,550.93	8.48	94.76	-101.15	-1,935.04	9,080.41	9,350.16	9,247.06	103.10	90.687			
2,700.00	2,646.03	2,514.13	2,646.03	9.06	98.57	-101.33	-1,935.04	9,080.41	9,356.49	9,249.01	107.48	87.053			
2,800.00	2,741.12	2,609.22	2,741.12	9.65	102.37	-101.51	-1,935.04	9,080.41	9,362.92	9,251.06	111.86	83.701			
2,900.00	2,836.22	2,704.32	2,836.22	10.25	106.17	-101.69	-1,935.04	9,080.41	9,369.44	9,253.20	116.24	80.602			
3,000.00	2,931.31	2,799.41	2,931.31	10.84	109.98	-101.86	-1,935.04	9,080.41	9,376.07	9,255.44	120.63	77.727			
3,100.00	3,026.41	2,894.51	3,026.41	11.44	113.78	-102.04	-1,935.04	9,080.41	9,382.79	9,257.77	125.01	75.054			
3,200.00	3,121.50	2,989.60	3,121.50	12.04	117.58	-102.21	-1,935.04	9,080.41	9,389.60	9,260.20	129.40	72.563			
3,300.00	3,216.60	3,084.70	3,216.60	12.64	121.39	-102.39	-1,935.04	9,080.41	9,396.52	9,262.73	133.79	70.235			
3,400.00	3,311.69	3,179.79	3,311.69	13.25	125.19	-102.57	-1,935.04	9,080.41	9,403.53	9,265.35	138.17	68.055			
3,500.00	3,406.79	3,274.89	3,406.79	13.85	129.00	-102.74	-1,935.04	9,080.41	9,410.64	9,268.07	142.56	66.011			
3,600.00	3,501.88	3,369.98	3,501.88	14.46	132.80	-102.92	-1,935.04	9,080.41	9,417.84	9,270.89	146.95	64.089			
3,700.00	3,596.98	3,465.08	3,596.98	15.07	136.60	-103.09	-1,935.04	9,080.41	9,425.14	9,273.80	151.34	62.279			
3,800.00	3,692.07	3,550.00	3,692.07	15.68	140.00	-103.25	-1,935.04	9,080.41	9,432.54	9,277.22	155.32	60.730			
3,900.00	3,787.17	3,550.00	3,692.07	16.28	140.00	-103.25	-1,935.04	9,080.41	9,440.61	9,284.68	159.93	60.545			
4,000.00	3,882.26	3,550.00	3,692.07	16.89	140.00	-103.25	-1,935.04	9,080.41	9,449.74	9,293.20	165.54	60.367			
4,100.00	3,977.36	3,550.00	3,692.07	17.51	140.00	-103.25	-1,935.04	9,080.41	9,459.91	9,302.76	171.15	60.197			
4,200.00	4,072.45	3,550.00	3,692.07	18.12	140.00	-103.25	-1,935.04	9,080.41	9,471.13	9,313.37	176.76	60.035			
4,300.00	4,167.55	3,550.00	3,692.07	18.73	140.00	-103.25	-1,935.04	9,080.41	9,483.38	9,325.01	182.37	59.881			
4,400.00	4,262.64	3,550.00	3,692.07	19.34	140.00	-103.25	-1,935.04	9,080.41	9,496.68	9,337.70	188.98	59.734			
4,500.00	4,357.74	3,550.00	3,692.07	19.95	140.00	-103.25	-1,935.04	9,080.41	9,511.01	9,351.41	195.59	59.595			
4,600.00	4,452.83	3,550.00	3,692.07	20.57	140.00	-103.25	-1,935.04	9,080.41	9,526.37	9,366.16	202.20	59.463			
4,700.00	4,547.93	3,550.00	3,692.07	21.18	140.00	-103.25	-1,935.04	9,080.41	9,542.75	9,381.93	208.82	59.338			
4,800.00	4,643.02	3,550.00	3,692.07	21.79	140.00	-103.25	-1,935.04	9,080.41	9,560.14	9,398.71	215.43	59.220			
4,900.00	4,738.12	3,550.00	3,692.07	22.41	140.00	-103.25	-1,935.04	9,080.41	9,578.55	9,416.51	222.05	59.110			
5,000.00	4,833.21	3,550.00	3,692.07	23.02	140.00	-103.25	-1,935.04	9,080.41	9,597.97	9,435.31	228.66	59.006			
5,100.00	4,928.31	3,550.00	3,692.07	23.63	140.00	-103.25	-1,935.04	9,080.41	9,618.39	9,455.11	235.28	58.909			
5,200.00	5,023.40	3,550.00	3,692.07	24.25	140.00	-103.25	-1,935.04	9,080.41	9,639.80	9,475.91	241.89	58.819			
5,300.00	5,118.50	3,550.00	3,692.07	24.86	140.00	-103.25	-1,935.04	9,080.41	9,662.20	9,497.70	248.50	58.735			
5,400.00	5,213.59	3,550.00	3,692.07	25.48	140.00	-103.25	-1,935.04	9,080.41	9,685.58	9,520.46	255.12	58.658			
5,500.00	5,308.69	3,550.00	3,692.07	26.09	140.00	-103.25	-1,935.04	9,080.41	9,709.94	9,544.20	261.73	58.587			
5,600.00	5,403.78	3,550.00	3,692.07	26.71	140.00	-103.25	-1,935.04	9,080.41	9,735.26	9,568.90	268.35	58.523			
5,700.00	5,498.91	3,550.00	3,692.07	27.30	140.00	-103.38	-1,935.04	9,080.41	9,761.51	9,594.56	274.96	58.471			
5,800.00	5,594.79	3,550.00	3,692.07	27.73	140.00	-103.92	-1,935.04	9,080.41	9,788.15	9,620.77	281.57	58.478			
5,900.00	5,691.59	3,550.00	3,692.07	28.11	140.00	-104.46	-1,935.04	9,080.41	9,814.93	9,647.15	288.18	58.500			
6,000.00	5,789.21	3,550.00	3,692.07	28.46	140.00	-105.00	-1,935.04	9,080.41	9,841.81	9,673.68	294.79	58.538			
6,100.00	5,887.53	3,550.00	3,692.07	28.77	140.00	-105.54	-1,935.04	9,080.41	9,868.77	9,700.33	301.40	58.592			
6,200.00	5,986.42	3,550.00	3,692.07	29.04	140.00	-106.08	-1,935.04	9,080.41	9,895.76	9,727.07	308.01	58.663			
6,300.00	6,085.77	3,550.00	3,692.07	29.26	140.00	-106.62	-1,935.04	9,080.41	9,922.77	9,753.87	314.62	58.752			
6,400.00	6,185.46	3,550.00	3,692.07	29.44	140.00	-107.15	-1,935.04	9,080.41	9,949.74	9,780.70	321.23	58.860			
6,500.00	6,285.36	3,550.00	3,692.07	29.58	140.00	-107.69	-1,935.04	9,080.41	9,976.66	9,807.52	327.84	58.987			

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
Site: NEBU 604 Pad
Well: NEBU 604 COM 3H
Wellbore: OH
Design: Plan #3

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



Scientific Drilling



Azimuths to Grid North
True North: -0.18°
Magnetic North: 8.97°

Magnetic Field
Strength: 50150.5snT
Dip Angle: 63.55°
Date: 7/21/2016
Model: HDGM

WELL DETAILS: NEBU 604 COM 3H

GL 6500' & RKB 25' @ 6525.00usft
+N/-S +E/-W Northing Easting Latitude Longitude
0.00 0.00 2147625.75 2811995.18 36.9015322 -107.5292698

Plan: Plan #3 (NEBU 604 COM 3H/OH)

Created By: Janie Collins Date: 15:52, June 22 2017

DESIGN TARGET DETAILS

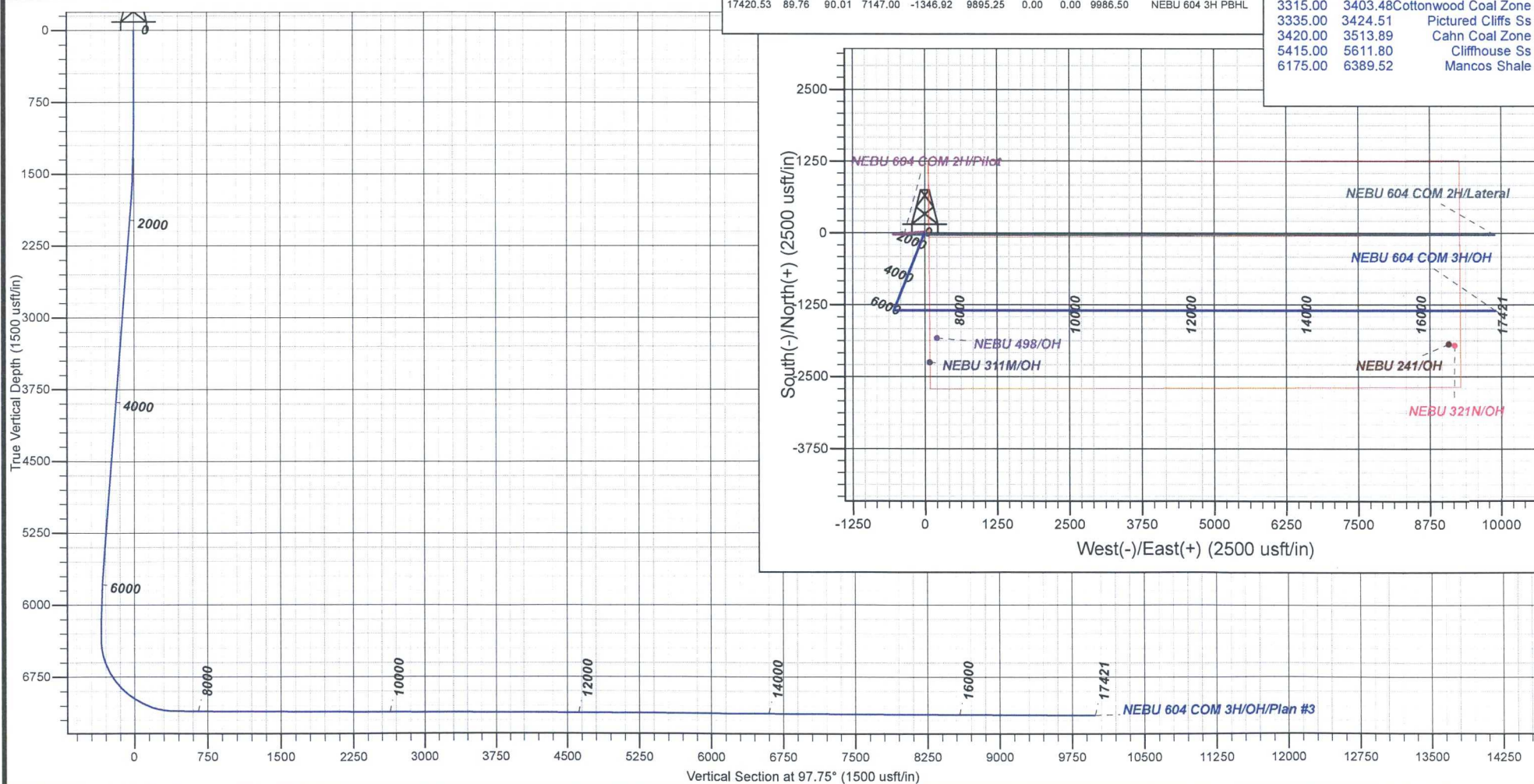
Name	TVD	+N/-S	+E/-W	Northing	Easting
NEBU 604 3H PBHL	7147.00	-1346.92	9895.25	2146278.83	2821890.43
NEBU 604 3H LP	7107.00	-1348.94	130.64	2146276.81	2812125.82

SECTION DETAILS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	Vsect	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
1000.00	0.00	0.00	1000.00	0.00	0.00	0.00	0.00	0.00	
1900.99	18.02	201.59	1886.21	-130.66	-51.70	2.00	201.59	-33.61	
5674.47	18.02	201.59	5474.60	-1218.09	-481.19	0.00	0.00	-312.77	
6575.46	0.00	0.00	6360.81	-1346.75	-532.89	2.00	180.00	-346.38	
7325.46	60.00	89.86	6981.06	-1345.88	-174.79	8.00	89.86	8.33	
7385.46	60.00	89.86	7011.06	-1345.75	-122.83	0.00	0.00	59.80	
7757.50	89.76	90.01	7107.00	-1345.38	232.31	8.00	0.30	411.64	
17420.53	89.76	90.01	7147.00	-1346.92	9895.25	0.00	0.00	9986.50	NEBU 604 3H PBHL

FORMATION TOP DETAILS

TVDPath	MDPath	Formation
28.00	28.00	San Jose Ss
2385.00	2425.51	Ojo Alamo Ss
2505.00	2551.70	Kirtland
3000.00	3072.23	Fruitland
3195.00	3277.29	Lemon Coal Zone
3240.00	3324.61	Ignacio Coal Zone
3315.00	3403.48	Cottonwood Coal Zone
3335.00	3424.51	Pictured Cliffs Ss
3420.00	3513.89	Cahn Coal Zone
5415.00	5611.80	Cliffhouse Ss
6175.00	6389.52	Mancos Shale





B.P.

San Juan County, NM NAD83

NEBU 604 Pad

NEBU 604 COM 3H

OH

Plan: Plan #3

Standard Planning Report

22 June, 2017



Scientific Drilling

www.scientificdrilling.com



Planning Report



Database:	Grand Junction District	Local Co-ordinate Reference:	Well NEBU 604 COM 3H
Company:	B.P.	TVD Reference:	GL 6500' & RKB 25' @ 6525.00usft
Project:	San Juan County, NM NAD83	MD Reference:	GL 6500' & RKB 25' @ 6525.00usft
Site:	NEBU 604 Pad	North Reference:	Grid
Well:	NEBU 604 COM 3H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #3		

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 604 Pad			
Site Position:		Northing:	2,147,663.38 usft	Latitude: 36.9016354
From:	Map	Easting:	2,812,008.74 usft	Longitude: -107.5292230
Position Uncertainty:	0.00 usft	Slot Radius:	13.20 in	Grid Convergence: 0.18 °

Well	NEBU 604 COM 3H			
Well Position	+N/-S	-37.63 usft	Northing:	2,147,625.75 usft
	+E/-W	-13.56 usft	Easting:	2,811,995.18 usft
Position Uncertainty	0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level: 6,500.00 usft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	7/21/2016	9.15	63.55	50,151

Design	Plan #3			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	0.00	0.00	97.75

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.00	0.00	0.00	0.00	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	
1,900.99	18.02	201.59	1,886.21	-130.66	-51.70	2.00	2.00	0.00	201.59	
5,674.47	18.02	201.59	5,474.60	-1,216.09	-481.19	0.00	0.00	0.00	0.00	
6,575.46	0.00	0.00	6,360.81	-1,346.75	-532.89	2.00	-2.00	0.00	180.00	
7,325.46	60.00	89.86	6,981.06	-1,345.88	-174.79	8.00	8.00	0.00	89.86	
7,385.46	60.00	89.86	7,011.06	-1,345.75	-122.83	0.00	0.00	0.00	0.00	
7,757.50	89.76	90.01	7,107.00	-1,345.38	232.31	8.00	8.00	0.04	0.30	
17,420.53	89.76	90.01	7,147.00	-1,346.92	9,895.25	0.00	0.00	0.00	0.00	NEBU 604 3H PBHL



Database: Grand Junction District
Company: B.P.
Project: San Juan County, NM NAD83
Site: NEBU 604 Pad
Well: NEBU 604 COM 3H
Wellbore: OH
Design: Plan #3

Local Co-ordinate Reference:
TVD Reference: GL 6500' & RKB 25' @ 6525.00usft
MD Reference: GL 6500' & RKB 25' @ 6525.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28.00	0.00	0.00	28.00	0.00	0.00	0.00	0.00	0.00	0.00
San Jose Ss									
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	2.00	201.59	1,099.98	-1.62	-0.64	-0.42	2.00	2.00	0.00
1,200.00	4.00	201.59	1,199.84	-6.49	-2.57	-1.67	2.00	2.00	0.00
1,300.00	6.00	201.59	1,299.45	-14.59	-5.77	-3.75	2.00	2.00	0.00
1,400.00	8.00	201.59	1,398.70	-25.92	-10.26	-6.67	2.00	2.00	0.00
1,500.00	10.00	201.59	1,497.47	-40.47	-16.01	-10.41	2.00	2.00	0.00
1,600.00	12.00	201.59	1,595.62	-58.21	-23.03	-14.97	2.00	2.00	0.00
1,700.00	14.00	201.59	1,693.06	-79.13	-31.31	-20.35	2.00	2.00	0.00
1,800.00	16.00	201.59	1,789.64	-103.19	-40.83	-26.54	2.00	2.00	0.00
1,900.00	18.00	201.59	1,885.27	-130.38	-51.59	-33.53	2.00	2.00	0.00
1,900.99	18.02	201.59	1,886.21	-130.66	-51.70	-33.61	2.00	2.00	0.00
2,000.00	18.02	201.59	1,980.36	-159.14	-62.97	-40.93	0.00	0.00	0.00
2,100.00	18.02	201.59	2,075.46	-187.91	-74.35	-48.33	0.00	0.00	0.00
2,200.00	18.02	201.59	2,170.55	-216.67	-85.73	-55.73	0.00	0.00	0.00
2,300.00	18.02	201.59	2,265.65	-245.44	-97.12	-63.13	0.00	0.00	0.00
2,400.00	18.02	201.59	2,360.74	-274.20	-108.50	-70.52	0.00	0.00	0.00
2,425.51	18.02	201.59	2,385.00	-281.54	-111.40	-72.41	0.00	0.00	0.00
Ojo Alamo Ss									
2,500.00	18.02	201.59	2,455.84	-302.96	-119.88	-77.92	0.00	0.00	0.00
2,551.70	18.02	201.59	2,505.00	-317.84	-125.76	-81.75	0.00	0.00	0.00
Kirtland									
2,600.00	18.02	201.59	2,550.93	-331.73	-131.26	-85.32	0.00	0.00	0.00
2,700.00	18.02	201.59	2,646.03	-360.49	-142.64	-92.72	0.00	0.00	0.00
2,800.00	18.02	201.59	2,741.12	-389.26	-154.02	-100.12	0.00	0.00	0.00
2,900.00	18.02	201.59	2,836.22	-418.02	-165.41	-107.51	0.00	0.00	0.00
3,000.00	18.02	201.59	2,931.31	-446.79	-176.79	-114.91	0.00	0.00	0.00
3,072.23	18.02	201.59	3,000.00	-467.56	-185.01	-120.26	0.00	0.00	0.00
Fruitland									
3,100.00	18.02	201.59	3,026.41	-475.55	-188.17	-122.31	0.00	0.00	0.00
3,200.00	18.02	201.59	3,121.50	-504.32	-199.55	-129.71	0.00	0.00	0.00
3,277.29	18.02	201.59	3,195.00	-526.55	-208.35	-135.43	0.00	0.00	0.00
Lemon Coal Zone									
3,300.00	18.02	201.59	3,216.60	-533.08	-210.93	-137.11	0.00	0.00	0.00
3,324.61	18.02	201.59	3,240.00	-540.16	-213.73	-138.93	0.00	0.00	0.00
Ignacio Coal Zone									
3,400.00	18.02	201.59	3,311.69	-561.85	-222.31	-144.50	0.00	0.00	0.00
3,403.48	18.02	201.59	3,315.00	-562.85	-222.71	-144.76	0.00	0.00	0.00
Cottonwood Coal Zone									
3,424.51	18.02	201.59	3,335.00	-568.90	-225.10	-146.32	0.00	0.00	0.00
Pictured Cliffs Ss									
3,500.00	18.02	201.59	3,406.79	-590.61	-233.70	-151.90	0.00	0.00	0.00



Database:	Grand Junction District	Local Co-ordinate Reference:	Well NEBU 604 COM 3H
Company:	B.P.	TVD Reference:	GL 6500' & RKB 25' @ 6525.00usft
Project:	San Juan County, NM NAD83	MD Reference:	GL 6500' & RKB 25' @ 6525.00usft
Site:	NEBU 604 Pad	North Reference:	Grid
Well:	NEBU 604 COM 3H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #3		

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)
3,513.89	18.02	201.59	3,420.00	-594.61	-235.28	-152.93	0.00	0.00	0.00
Cahn Coal Zone									
3,600.00	18.02	201.59	3,501.88	-619.38	-245.08	-159.30	0.00	0.00	0.00
3,700.00	18.02	201.59	3,596.98	-648.14	-256.46	-166.70	0.00	0.00	0.00
3,800.00	18.02	201.59	3,692.07	-676.90	-267.84	-174.10	0.00	0.00	0.00
3,900.00	18.02	201.59	3,787.17	-705.67	-279.22	-181.50	0.00	0.00	0.00
4,000.00	18.02	201.59	3,882.26	-734.43	-290.61	-188.89	0.00	0.00	0.00
4,100.00	18.02	201.59	3,977.36	-763.20	-301.99	-196.29	0.00	0.00	0.00
4,200.00	18.02	201.59	4,072.45	-791.96	-313.37	-203.69	0.00	0.00	0.00
4,300.00	18.02	201.59	4,167.55	-820.73	-324.75	-211.09	0.00	0.00	0.00
4,400.00	18.02	201.59	4,262.64	-849.49	-336.13	-218.49	0.00	0.00	0.00
4,500.00	18.02	201.59	4,357.74	-878.26	-347.51	-225.88	0.00	0.00	0.00
4,600.00	18.02	201.59	4,452.83	-907.02	-358.90	-233.28	0.00	0.00	0.00
4,700.00	18.02	201.59	4,547.93	-935.79	-370.28	-240.68	0.00	0.00	0.00
4,800.00	18.02	201.59	4,643.02	-964.55	-381.66	-248.08	0.00	0.00	0.00
4,900.00	18.02	201.59	4,738.12	-993.31	-393.04	-255.48	0.00	0.00	0.00
5,000.00	18.02	201.59	4,833.21	-1,022.08	-404.42	-262.88	0.00	0.00	0.00
5,100.00	18.02	201.59	4,928.31	-1,050.84	-415.80	-270.27	0.00	0.00	0.00
5,200.00	18.02	201.59	5,023.40	-1,079.61	-427.19	-277.67	0.00	0.00	0.00
5,300.00	18.02	201.59	5,118.50	-1,108.37	-438.57	-285.07	0.00	0.00	0.00
5,400.00	18.02	201.59	5,213.59	-1,137.14	-449.95	-292.47	0.00	0.00	0.00
5,500.00	18.02	201.59	5,308.69	-1,165.90	-461.33	-299.87	0.00	0.00	0.00
5,600.00	18.02	201.59	5,403.78	-1,194.67	-472.71	-307.26	0.00	0.00	0.00
5,611.80	18.02	201.59	5,415.00	-1,198.06	-474.06	-308.14	0.00	0.00	0.00
Cliffhouse Ss									
5,674.47	18.02	201.59	5,474.60	-1,216.09	-481.19	-312.77	0.00	0.00	0.00
5,700.00	17.51	201.59	5,498.91	-1,223.33	-484.05	-314.64	2.00	-2.00	0.00
5,800.00	15.51	201.59	5,594.79	-1,249.75	-494.51	-321.43	2.00	-2.00	0.00
5,900.00	13.51	201.59	5,691.59	-1,273.05	-503.73	-327.42	2.00	-2.00	0.00
6,000.00	11.51	201.59	5,789.21	-1,293.19	-511.70	-332.60	2.00	-2.00	0.00
6,100.00	9.51	201.59	5,887.53	-1,310.15	-518.41	-336.96	2.00	-2.00	0.00
6,200.00	7.51	201.59	5,986.42	-1,323.90	-523.85	-340.50	2.00	-2.00	0.00
6,300.00	5.51	201.59	6,085.77	-1,334.45	-528.02	-343.21	2.00	-2.00	0.00
6,389.52	3.72	201.59	6,175.00	-1,341.14	-530.67	-344.94	2.00	-2.00	0.00
Mancos Shale									
6,400.00	3.51	201.59	6,185.46	-1,341.76	-530.91	-345.09	2.00	-2.00	0.00
6,500.00	1.51	201.59	6,285.36	-1,345.83	-532.52	-346.14	2.00	-2.00	0.00
6,575.46	0.00	0.00	6,360.81	-1,346.75	-532.89	-346.38	2.00	-2.00	0.00
6,600.00	1.96	89.86	6,385.35	-1,346.75	-532.47	-345.96	8.00	8.00	0.00
6,700.00	9.96	89.86	6,484.72	-1,346.72	-522.09	-335.68	8.00	8.00	0.00
6,800.00	17.96	89.86	6,581.69	-1,346.66	-497.98	-311.80	8.00	8.00	0.00
6,900.00	25.96	89.86	6,674.36	-1,346.57	-460.61	-274.78	8.00	8.00	0.00
7,000.00	33.96	89.86	6,760.92	-1,346.45	-410.70	-225.35	8.00	8.00	0.00
7,100.00	41.96	89.86	6,839.70	-1,346.30	-349.24	-164.47	8.00	8.00	0.00
7,200.00	49.96	89.86	6,909.15	-1,346.13	-277.41	-93.32	8.00	8.00	0.00
7,300.00	57.96	89.86	6,967.94	-1,345.93	-196.61	-13.28	8.00	8.00	0.00
7,325.46	60.00	89.86	6,981.06	-1,345.88	-174.79	8.33	8.00	8.00	0.00
7,385.46	60.00	89.86	7,011.06	-1,345.75	-122.83	59.80	0.00	0.00	0.00
7,400.00	61.16	89.87	7,018.20	-1,345.72	-110.17	72.34	8.00	8.00	0.05
7,500.00	69.16	89.91	7,060.17	-1,345.54	-19.49	162.17	8.00	8.00	0.04
7,600.00	77.16	89.95	7,089.11	-1,345.43	76.15	256.91	8.00	8.00	0.04
7,656.64	81.69	89.97	7,099.50	-1,345.39	131.81	312.06	8.00	8.00	0.04
NEBU 604 3H LP									
7,700.00	85.16	89.99	7,104.46	-1,345.38	174.88	354.74	8.00	8.00	0.04



Database: Grand Junction District
Company: B.P.
Project: San Juan County, NM NAD83
Site: NEBU 604 Pad
Well: NEBU 604 COM 3H
Wellbore: OH
Design: Plan #3

Local Co-ordinate Reference: Well NEBU 604 COM 3H
TVD Reference: GL 6500' & RKB 25' @ 6525.00usft
MD Reference: GL 6500' & RKB 25' @ 6525.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature

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)
7,757.50	89.76	90.01	7,107.00	-1,345.38	232.31	411.64	8.00	8.00	0.04
7,800.00	89.76	90.01	7,107.18	-1,345.38	274.81	453.75	0.00	0.00	0.00
7,900.00	89.76	90.01	7,107.59	-1,345.40	374.81	552.84	0.00	0.00	0.00
8,000.00	89.76	90.01	7,108.01	-1,345.41	474.80	651.93	0.00	0.00	0.00
8,100.00	89.76	90.01	7,108.42	-1,345.43	574.80	751.02	0.00	0.00	0.00
8,200.00	89.76	90.01	7,108.83	-1,345.45	674.80	850.10	0.00	0.00	0.00
8,300.00	89.76	90.01	7,109.25	-1,345.46	774.80	949.19	0.00	0.00	0.00
8,400.00	89.76	90.01	7,109.66	-1,345.48	874.80	1,048.28	0.00	0.00	0.00
8,500.00	89.76	90.01	7,110.08	-1,345.49	974.80	1,147.37	0.00	0.00	0.00
8,600.00	89.76	90.01	7,110.49	-1,345.51	1,074.80	1,246.45	0.00	0.00	0.00
8,700.00	89.76	90.01	7,110.90	-1,345.53	1,174.80	1,345.54	0.00	0.00	0.00
8,800.00	89.76	90.01	7,111.32	-1,345.54	1,274.80	1,444.63	0.00	0.00	0.00
8,900.00	89.76	90.01	7,111.73	-1,345.56	1,374.80	1,543.72	0.00	0.00	0.00
9,000.00	89.76	90.01	7,112.15	-1,345.57	1,474.80	1,642.80	0.00	0.00	0.00
9,100.00	89.76	90.01	7,112.56	-1,345.59	1,574.80	1,741.89	0.00	0.00	0.00
9,200.00	89.76	90.01	7,112.97	-1,345.61	1,674.79	1,840.98	0.00	0.00	0.00
9,300.00	89.76	90.01	7,113.39	-1,345.62	1,774.79	1,940.07	0.00	0.00	0.00
9,400.00	89.76	90.01	7,113.80	-1,345.64	1,874.79	2,039.15	0.00	0.00	0.00
9,500.00	89.76	90.01	7,114.22	-1,345.65	1,974.79	2,138.24	0.00	0.00	0.00
9,600.00	89.76	90.01	7,114.63	-1,345.67	2,074.79	2,237.33	0.00	0.00	0.00
9,700.00	89.76	90.01	7,115.04	-1,345.69	2,174.79	2,336.42	0.00	0.00	0.00
9,800.00	89.76	90.01	7,115.46	-1,345.70	2,274.79	2,435.50	0.00	0.00	0.00
9,900.00	89.76	90.01	7,115.87	-1,345.72	2,374.79	2,534.59	0.00	0.00	0.00
10,000.00	89.76	90.01	7,116.28	-1,345.73	2,474.79	2,633.68	0.00	0.00	0.00
10,100.00	89.76	90.01	7,116.70	-1,345.75	2,574.79	2,732.77	0.00	0.00	0.00
10,200.00	89.76	90.01	7,117.11	-1,345.77	2,674.79	2,831.85	0.00	0.00	0.00
10,300.00	89.76	90.01	7,117.53	-1,345.78	2,774.79	2,930.94	0.00	0.00	0.00
10,400.00	89.76	90.01	7,117.94	-1,345.80	2,874.78	3,030.03	0.00	0.00	0.00
10,500.00	89.76	90.01	7,118.35	-1,345.81	2,974.78	3,129.12	0.00	0.00	0.00
10,600.00	89.76	90.01	7,118.77	-1,345.83	3,074.78	3,228.21	0.00	0.00	0.00
10,700.00	89.76	90.01	7,119.18	-1,345.85	3,174.78	3,327.29	0.00	0.00	0.00
10,800.00	89.76	90.01	7,119.60	-1,345.86	3,274.78	3,426.38	0.00	0.00	0.00
10,900.00	89.76	90.01	7,120.01	-1,345.88	3,374.78	3,525.47	0.00	0.00	0.00
11,000.00	89.76	90.01	7,120.42	-1,345.89	3,474.78	3,624.56	0.00	0.00	0.00
11,100.00	89.76	90.01	7,120.84	-1,345.91	3,574.78	3,723.64	0.00	0.00	0.00
11,200.00	89.76	90.01	7,121.25	-1,345.93	3,674.78	3,822.73	0.00	0.00	0.00
11,300.00	89.76	90.01	7,121.67	-1,345.94	3,774.78	3,921.82	0.00	0.00	0.00
11,400.00	89.76	90.01	7,122.08	-1,345.96	3,874.78	4,020.91	0.00	0.00	0.00
11,500.00	89.76	90.01	7,122.49	-1,345.97	3,974.77	4,119.99	0.00	0.00	0.00
11,600.00	89.76	90.01	7,122.91	-1,345.99	4,074.77	4,219.08	0.00	0.00	0.00
11,700.00	89.76	90.01	7,123.32	-1,346.01	4,174.77	4,318.17	0.00	0.00	0.00
11,800.00	89.76	90.01	7,123.74	-1,346.02	4,274.77	4,417.26	0.00	0.00	0.00
11,900.00	89.76	90.01	7,124.15	-1,346.04	4,374.77	4,516.34	0.00	0.00	0.00
12,000.00	89.76	90.01	7,124.56	-1,346.05	4,474.77	4,615.43	0.00	0.00	0.00
12,100.00	89.76	90.01	7,124.98	-1,346.07	4,574.77	4,714.52	0.00	0.00	0.00
12,200.00	89.76	90.01	7,125.39	-1,346.09	4,674.77	4,813.61	0.00	0.00	0.00
12,300.00	89.76	90.01	7,125.80	-1,346.10	4,774.77	4,912.69	0.00	0.00	0.00
12,400.00	89.76	90.01	7,126.22	-1,346.12	4,874.77	5,011.78	0.00	0.00	0.00
12,500.00	89.76	90.01	7,126.63	-1,346.13	4,974.77	5,110.87	0.00	0.00	0.00
12,600.00	89.76	90.01	7,127.05	-1,346.15	5,074.77	5,209.96	0.00	0.00	0.00
12,700.00	89.76	90.01	7,127.46	-1,346.17	5,174.76	5,309.04	0.00	0.00	0.00
12,800.00	89.76	90.01	7,127.87	-1,346.18	5,274.76	5,408.13	0.00	0.00	0.00
12,900.00	89.76	90.01	7,128.29	-1,346.20	5,374.76	5,507.22	0.00	0.00	0.00
13,000.00	89.76	90.01	7,128.70	-1,346.21	5,474.76	5,606.31	0.00	0.00	0.00



Database:	Grand Junction District	Local Co-ordinate Reference:	Well NEBU 604 COM 3H
Company:	B.P.	TVD Reference:	GL 6500' & RKB 25' @ 6525.00usft
Project:	San Juan County, NM NAD83	MD Reference:	GL 6500' & RKB 25' @ 6525.00usft
Site:	NEBU 604 Pad	North Reference:	Grid
Well:	NEBU 604 COM 3H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #3		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
13,100.00	89.76	90.01	7,129.12	-1,346.23	5,574.76	5,705.39	0.00	0.00	0.00
13,200.00	89.76	90.01	7,129.53	-1,346.25	5,674.76	5,804.48	0.00	0.00	0.00
13,300.00	89.76	90.01	7,129.94	-1,346.26	5,774.76	5,903.57	0.00	0.00	0.00
13,400.00	89.76	90.01	7,130.36	-1,346.28	5,874.76	6,002.66	0.00	0.00	0.00
13,500.00	89.76	90.01	7,130.77	-1,346.29	5,974.76	6,101.74	0.00	0.00	0.00
13,600.00	89.76	90.01	7,131.19	-1,346.31	6,074.76	6,200.83	0.00	0.00	0.00
13,700.00	89.76	90.01	7,131.60	-1,346.33	6,174.76	6,299.92	0.00	0.00	0.00
13,800.00	89.76	90.01	7,132.01	-1,346.34	6,274.76	6,399.01	0.00	0.00	0.00
13,900.00	89.76	90.01	7,132.43	-1,346.36	6,374.75	6,498.10	0.00	0.00	0.00
14,000.00	89.76	90.01	7,132.84	-1,346.37	6,474.75	6,597.18	0.00	0.00	0.00
14,100.00	89.76	90.01	7,133.26	-1,346.39	6,574.75	6,696.27	0.00	0.00	0.00
14,200.00	89.76	90.01	7,133.67	-1,346.41	6,674.75	6,795.36	0.00	0.00	0.00
14,300.00	89.76	90.01	7,134.08	-1,346.42	6,774.75	6,894.45	0.00	0.00	0.00
14,400.00	89.76	90.01	7,134.50	-1,346.44	6,874.75	6,993.53	0.00	0.00	0.00
14,500.00	89.76	90.01	7,134.91	-1,346.45	6,974.75	7,092.62	0.00	0.00	0.00
14,600.00	89.76	90.01	7,135.33	-1,346.47	7,074.75	7,191.71	0.00	0.00	0.00
14,700.00	89.76	90.01	7,135.74	-1,346.49	7,174.75	7,290.80	0.00	0.00	0.00
14,800.00	89.76	90.01	7,136.15	-1,346.50	7,274.75	7,389.88	0.00	0.00	0.00
14,900.00	89.76	90.01	7,136.57	-1,346.52	7,374.75	7,488.97	0.00	0.00	0.00
15,000.00	89.76	90.01	7,136.98	-1,346.53	7,474.74	7,588.06	0.00	0.00	0.00
15,100.00	89.76	90.01	7,137.39	-1,346.55	7,574.74	7,687.15	0.00	0.00	0.00
15,200.00	89.76	90.01	7,137.81	-1,346.57	7,674.74	7,786.23	0.00	0.00	0.00
15,300.00	89.76	90.01	7,138.22	-1,346.58	7,774.74	7,885.32	0.00	0.00	0.00
15,400.00	89.76	90.01	7,138.64	-1,346.60	7,874.74	7,984.41	0.00	0.00	0.00
15,500.00	89.76	90.01	7,139.05	-1,346.61	7,974.74	8,083.50	0.00	0.00	0.00
15,600.00	89.76	90.01	7,139.46	-1,346.63	8,074.74	8,182.58	0.00	0.00	0.00
15,700.00	89.76	90.01	7,139.88	-1,346.65	8,174.74	8,281.67	0.00	0.00	0.00
15,800.00	89.76	90.01	7,140.29	-1,346.66	8,274.74	8,380.76	0.00	0.00	0.00
15,900.00	89.76	90.01	7,140.71	-1,346.68	8,374.74	8,479.85	0.00	0.00	0.00
16,000.00	89.76	90.01	7,141.12	-1,346.69	8,474.74	8,578.93	0.00	0.00	0.00
16,100.00	89.76	90.01	7,141.53	-1,346.71	8,574.74	8,678.02	0.00	0.00	0.00
16,200.00	89.76	90.01	7,141.95	-1,346.72	8,674.73	8,777.11	0.00	0.00	0.00
16,300.00	89.76	90.01	7,142.36	-1,346.74	8,774.73	8,876.20	0.00	0.00	0.00
16,400.00	89.76	90.01	7,142.78	-1,346.76	8,874.73	8,975.28	0.00	0.00	0.00
16,500.00	89.76	90.01	7,143.19	-1,346.77	8,974.73	9,074.37	0.00	0.00	0.00
16,600.00	89.76	90.01	7,143.60	-1,346.79	9,074.73	9,173.46	0.00	0.00	0.00
16,700.00	89.76	90.01	7,144.02	-1,346.80	9,174.73	9,272.55	0.00	0.00	0.00
16,800.00	89.76	90.01	7,144.43	-1,346.82	9,274.73	9,371.64	0.00	0.00	0.00
16,900.00	89.76	90.01	7,144.85	-1,346.84	9,374.73	9,470.72	0.00	0.00	0.00
17,000.00	89.76	90.01	7,145.26	-1,346.85	9,474.73	9,569.81	0.00	0.00	0.00
17,100.00	89.76	90.01	7,145.67	-1,346.87	9,574.73	9,668.90	0.00	0.00	0.00
17,200.00	89.76	90.01	7,146.09	-1,346.88	9,674.73	9,767.99	0.00	0.00	0.00
17,300.00	89.76	90.01	7,146.50	-1,346.90	9,774.73	9,867.07	0.00	0.00	0.00
17,400.00	89.76	90.01	7,146.92	-1,346.92	9,874.72	9,966.16	0.00	0.00	0.00
17,420.53	89.76	90.01	7,147.00	-1,346.92	9,895.25	9,986.50	0.00	0.00	0.00

NEBU 604 3H PBHL



Database:	Grand Junction District	Local Co-ordinate Reference:	Well NEBU 604 COM 3H
Company:	B.P.	TVD Reference:	GL 6500' & RKB 25' @ 6525.00usft
Project:	San Juan County, NM NAD83	MD Reference:	GL 6500' & RKB 25' @ 6525.00usft
Site:	NEBU 604 Pad	North Reference:	Grid
Well:	NEBU 604 COM 3H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #3		

Design Targets

Target Name

- hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
NEBU 604 3H LP - plan misses target center by 8.38usft at 7656.64usft MD (7099.50 TVD, -1345.39 N, 131.81 E) - Point	0.00	0.01	7,107.00	-1,348.94	130.64	2,146,276.81	2,812,125.82	36.8978258	-107.5288377
NEBU 604 3H PBHL - plan hits target center - Point	0.00	0.00	7,147.00	-1,346.92	9,895.25	2,146,278.83	2,821,890.43	36.8977411	-107.4954434

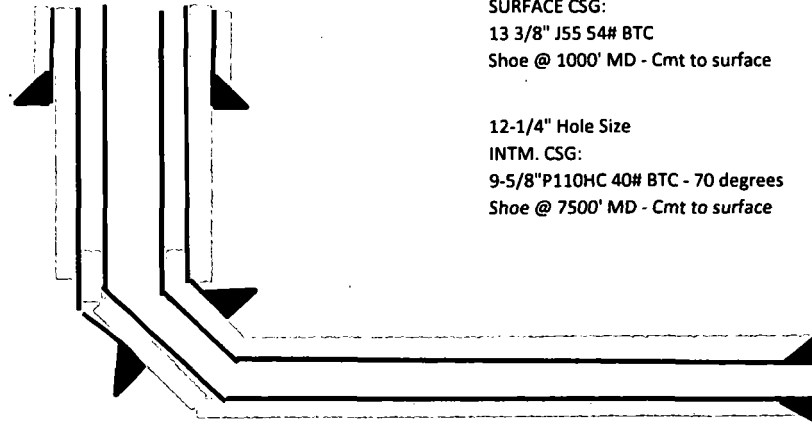
Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
28.00	28.00	San Jose Ss		0.00	0.00
2,425.51	2,385.00	Ojo Alamo Ss		0.00	0.00
2,551.70	2,505.00	Kirtland		0.00	0.00
3,072.23	3,000.00	Fruitland		0.00	0.00
3,277.29	3,195.00	Lemon Coal Zone		0.00	0.00
3,324.61	3,240.00	Ignacio Coal Zone		0.00	0.00
3,403.48	3,315.00	Cottonwood Coal Zone		0.00	0.00
3,424.51	3,335.00	Pictured Cliffs Ss		0.00	0.00
3,513.89	3,420.00	Cahn Coal Zone		0.00	0.00
5,611.80	5,415.00	Cliffhouse Ss		0.00	0.00
6,389.52	6,175.00	Mancos Shale		0.00	0.00

NEBU 604 Com-3H PILOT HOLE WBD

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

Marker	TVD	MD
Animas	25	25
Ojo Alamo	2385	2427
Kirtland	2505	3076
Fruitland Coal	3000	3076
Pictured Cliffs	3335	3430
Cliffhouse	5415	5620
Mancos	6180	6390
TD	7030	17370



17.5" Hole Size

SURFACE CSG:

13 3/8" J55 54# BTC

Shoe @ 1000' MD - Cmt to surface

12-1/4" Hole Size

INTM. CSG:

9-5/8" P110HC 40# BTC - 70 degrees

Shoe @ 7500' MD - Cmt to surface

8-3/4" Hole Size

Prod Csg:

5-1/2" P110 20# GBCD

Shoe @ 17420' MD -

Cmt to overlap 9-5/8" shoe @ ~6400'