

State of New Mexico
Energy, Minerals and Natural Resources Department

Susana Martinez
Governor

Ken McQueen
Cabinet Secretary

Matthias Sayer
Deputy Cabinet Secretary

David R. Catanach, 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 3160-3 APD form.

Operator Signature Date: 8/2/17

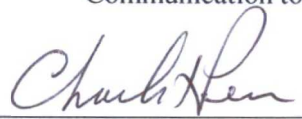
Well information;

Operator BP, Well Name and Number Northeast Blanco Unit 605 COM 1H

API# 30-045-3551, Section 11, Township 31 NS, Range 7 EW

Conditions of Approval: (See the below checked and handwritten conditions)

- ☒ Notify Aztec OCD 24hrs prior to casing & cement.
- ☒ 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 recompletion operations
- ☒ Regarding Hydraulic Fracturing, review EPA Underground Injection Control Guidance 84
- ☒ 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.



NMOCD Approved by Signature

11-2-2017

Date

OIL CONS. DIV DIST. 3

Form 3160-3
(March 2012)

OCT 20 2017

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL OR REENTER

FORM APPROVED
OMB No. 1004-0137
Expires October 31, 2014

1a. Type of work: ☒ DRILL ☐ REENTER		5. Lease Serial No. NMNM03358
1b. Type of Well: ☐ Oil Well ☒ Gas Well ☐ Other ☒ Single Zone ☐ Multiple Zone		6. If Indian, Allottee or Tribe Name
2. Name of Operator BP AMERICA PRODUCTION COMPANY		7. If Unit or CA Agreement, Name and No.
3a. Address 737 North Eldridge Pkwy Houston TX 77079		8. Lease Name and Well No. NEBU 605 COM 1H
3b. Phone No. (include area code) (281)366-7148		9. API Well No. 30-045-35851
4. Location of Well (Report location clearly and in accordance with any State requirements.) At surface SESE / 440 FSL / 805 FEL / LAT 36.907989 / LONG -107.534066 At proposed prod. zone SESE / 438 FSL / 50 FEL / LAT 36.907954 / LONG -107.495454		10. Field and Pool, or Exploratory BASIN MANCOS GAS POOL
14. Distance in miles and direction from nearest town or post office* 26.6 miles		11. Sec., T. R. M. or Blk. and Survey or Area SEC 11 / T31N / R07W / NMP
15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. unit line, if any) 250 feet	16. No. of acres in lease 2396.77	12. County or Parish SAN JUAN
17. Spacing Unit dedicated to this well 960	13. State NM	
18. Distance from proposed location* to nearest well, drilling, completed, 453 feet applied for, on this lease, ft.	19. Proposed Depth 7023 feet / 18876 feet	20. BLM/BIA Bond No. on file FED: WY2924
21. Elevations (Show whether DF, KDB, RT, GL, etc.) 6471 feet	22. Approximate date work will start* 03/01/2018	23. Estimated duration 30 days

24. Attachments

The following, completed in accordance with the requirements of Onshore Oil and Gas Order No.1, must be attached to this form:

- | | |
|--|---|
| 1. Well plat certified by a registered surveyor. | 4. Bond to cover the operations unless covered by an existing bond on file (see Item 20 above). |
| 2. A Drilling Plan. | 5. Operator certification |
| 3. A Surface Use Plan (if the location is on National Forest System Lands, the SUPO must be filed with the appropriate Forest Service Office). | 6. Such other site specific information and/or plans as may be required by the BLM. |

25. Signature (Electronic Submission)	Name (Printed/Typed) Toya Colvin / Ph: (281)366-7148	Date 08/02/2017
Title Regulatory Analyst		
Approved by (Signature) <i>[Signature]</i> AFM	Name (Printed/Typed)	Date 10/17/17
Title	Office FARMINGTON	

Application approval 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.
Conditions of approval, if any, are attached.

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.

(Continued on page 2)

*(Instructions on page 2)

**DRILLING OPERATIONS
AUTHORIZED ARE SUBJECT TO
COMPLIANCE WITH ATTACHED
"GENERAL REQUIREMENTS"**

**BLM'S APPROVAL OR ACCEPTANCE OF THIS
ACTION DOES NOT RELIEVE THE LESSEE AND
OPERATOR FROM OBTAINING ANY OTHER
AUTHORIZATION REQUIRED FOR OPERATIONS
ON FEDERAL AND INDIAN LANDS**

This action is subject to technical
and procedural review pursuant to
43 CFR 3165.3 and appeal
pursuant to 43 CFR 3165.4

NMOCD FV

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 319800	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

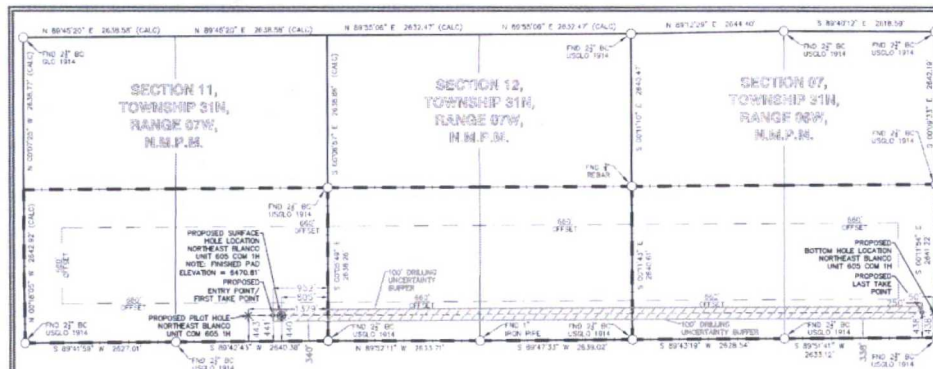
¹⁰ Surface Location

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
P	11	31N	07W		440	South	805	East	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
P	07	31N	06W		438	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.
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 PILOT HOLE	N (Y) = 2,149,972.24' E (X) = 2,810,011.95'	LAT. = 36.90799454°N LON. = 107.53602762°W	FSL = 443' FEL = 1379'
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'

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 7/25/17
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.

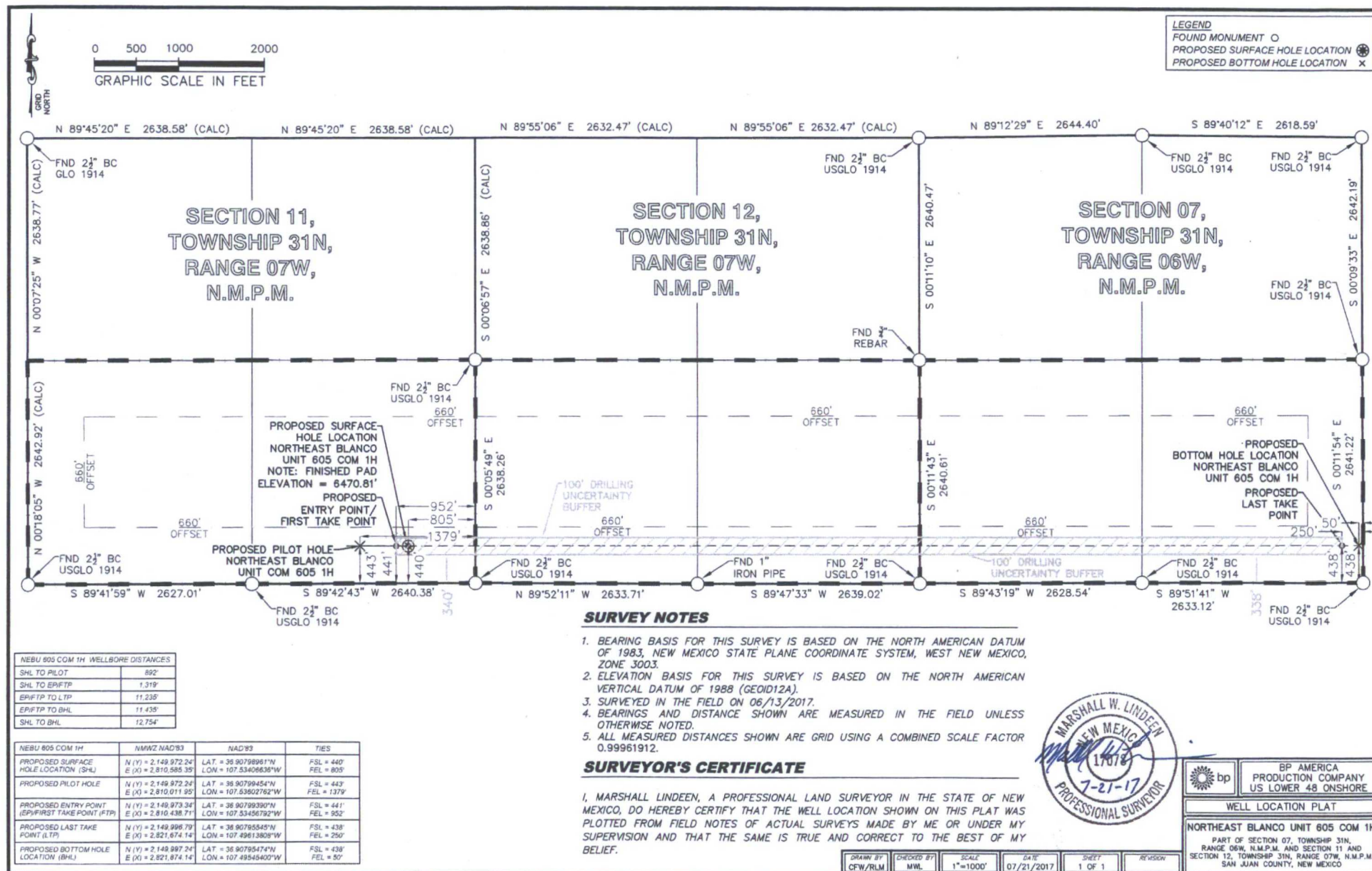
6-13-17
Date of Survey

Signature and Seal of Professional Surveyor



Certificate Number
17078

See Surface



**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 Pilot: 443' FSL – 1379' FEL
Section 11, T31N, R07W
Proposed Bottom Hole Location Lateral: 438' 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 – Pilot – Dakota	8,146	8,243	Gas-bearing	0.33
TD – Lateral - Mancos	7,023	18,876	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).

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.

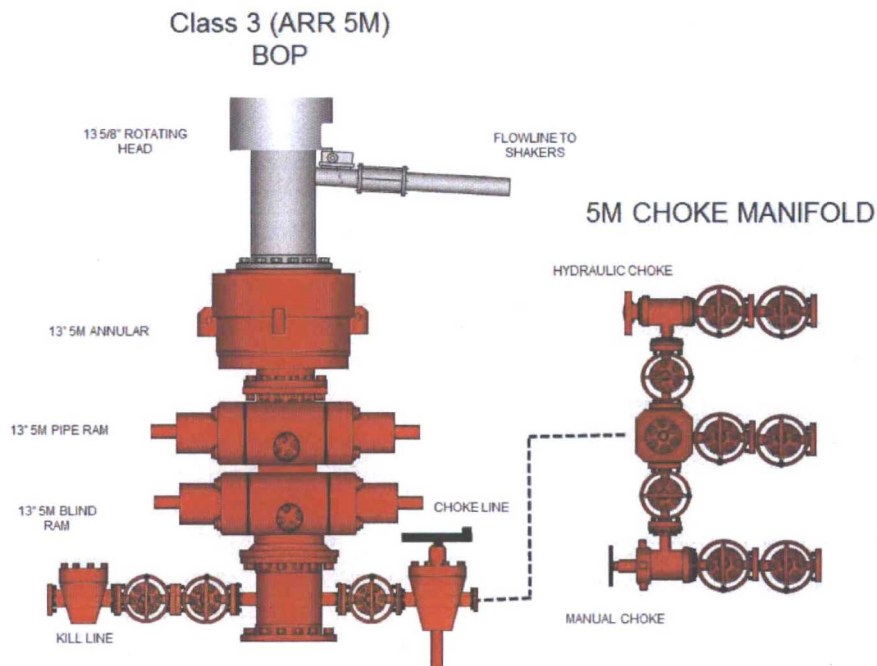
SECTION – 2 BOPE

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	7,023 TVD	3,020	1,475

13-5/8" BOPE



SECTION – 3 Casing

Bit Program

17.5" Conductor Hole = Surface to 120'
 12 1/4" Surface Hole = 120' to 1,000'
 8 3/4" Intermediate Hole = 1,000' to 6,400'
 6 1/8" Pilot = 6,400' MD to 8,243' MD
 6 1/8" Curve/Lateral = 6,400' MD to 18,876' MD

Casing Program – all casing stings are new casing

Type	Casing & Hole Size	Weight	Grade	Coupling	Setting Depth (MD)	Comments
Conductor	13 -3/8" (17.5")	54 ppf	J55	BT&C	0' - 120'	New casing. Conductor Casing maybe preset. Will be cemented to surface
Surface	9-5/8" (12-1/4")	36 ppf	J-55	LT&C	0' – 1,000'	New Casing. Surface Casing maybe preset
Intermediate	7" (8-3/4")	29 ppf	Q125	BT&C	0' – 6,400'	New Casing. Two Stage Cement to surface
Production Liner	4-1/2" (6-1/8")	13.5 ppf	P-110	GBCD	6,200' – 18,876'	New Casing – Single Stage Cement to overlap previous casing shoe

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)	Notes
Surface	13.375	54	K55	BTC	1,130	2,740	853,000	909,000	
					80% of Burst =	2,192			

[illegible]

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)	Notes
Intermediate	9.625	36	J55	LTC	2,020	3,520	564,000	453,000	
					80% of Burst =	2,816			

	Casing Depth TVD	MW in	MW out	Pres in	Pres out	SF	
Collapse	1000	0.00	10.00	0	520	3.88	Full evacuation with 10 ppg mud outside
Burst	1000	9.0	0	1500	0	2.35	1500 psi casing test
		Mud Wt	Air Wt	Bouy Wt	BW +100k		
Tension (Pipe Body)	1000	9.0	36,000	31,053	131,053	4.30	100k over pull
Tension (Connection)	1000	9.0	36,000	31,053	131,053	3.46	
	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)	Notes
Intermediate	7	29	Q125	BTC	9,100	12,750	1,056,000	1,045,000	
					80% of Burst =	10,200			

	Casing Depth TVD	MW in	MW out	Pres in	Pres out	SF	
Collapse	6309	0.00	10.00	0	3281	2.77	Full evacuation with 10 ppg mud outside
Burst	6309	9.0	0	1500	0	8.50	1500 psi casing test
		Mud Wt	Air Wt	Bouy Wt	BW +100k		
Tension (Pipe Body)	6309	9.0	182,961	157,821	257,821	4.10	100k over pull
Tension (Connection)	6309	9.0	182,961	157,821	257,821	4.05	
	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	4.5	13.5	P110	GBCD	10,680	12,420	422,000	443,000	
					80% of Burst =		9,936		
	Casing Depth TVD	MW in	MW out	Pres in	Pres out	SF			
Collapse	7023	0.00	13.30	0	4857	2.20	Full evacuation with 13.3 ppg cement in the annulus		
Burst	7023	9.0	0	1500	0	8.28	1500 psi casing test		
		Mud Wt	Air Wt	Bouy Wt	BW +100k				
Tension (Pipe Body)	7023	9.0	94,811	81,783	181,783	2.32	100k over pull		
Tension (Connection)	7023	9.0	94,811	81,783	181,783	2.44			
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 every 3rd joint to surface.

Intermediate casing – Centralizers shall be placed on first 3 (bottom 3) joints of casing (1 per joint) and 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): 17-1/2" hole x 13-3/8" casing – 100% XS

Cement will be circulated to surface with 142 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 166 ft³

Surface Casing Single Stage Job – (0-1,000' MD/TVD): 12-1/4" hole x 9-5/8" casing – 100% XS

Cement will be circulated to surface with 83 sx of Poz cement, 12.3 ppg, 2.401 ft³/sk, 94 lbm/sk, 2% CaCl, 0.1250 lbm/sk Poly E Flake, 13.29 Gal/sk fresh water. Tail – 110 sx 13.5 ppg, 1.844 ft³/sk, 94 lbm/sk, 0.10% Halad, 0.150 lbm/sk Poly E Flake, 9.16 Gal/sk fresh water. Volume 401 ft³

Intermediate Casing – Two Stage (0-6,400' MD/6,309' TVD): 8-3/4" (1,000' to 6,400') hole x 7" 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 (6200' - 18,876' MD/ 7,023' TVD) 6-1/8" hole x 4-1/2" casing:

Estimated top of cement at 7,200' MD. 808 sx of Poz cement, 13.5 ppg, 1.844 ft³/sk, 94 lbm/sk, 2% CaCl, 0.1250 lbm/sk Poly E Flake, 5.13 Gal/sk fresh water Volume 1491 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	17 -1/2"	FW/Gel	8.4	NC	8	12	9.0	Spud Mud
0'-1,000'	Surface	12-1/4"	FW/Gel	8.4	NC	8	12	9.0	Spud Mud
1,000'-6,400'	Intermediate	8-3/4"	LSND	8.6-10.0	<8	4-6	12-15	10.0	Fresh Water
6,400'-18,876'	Production	6-1/8"	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'-6,400'	Intermediate	8-3/4"	Aerated Fluid	7.5-9.0	<8	4-6	12-15	10.0	Fresh water w/ air
6,400'-18,876'	Production	6-1/8"	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

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

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

Triple Combo - Pilot Hole to Intermediate Casing Shoe

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 @ 7,023' TVD: 3,008 psi

Maximum expected BHT @ 8,146' TVD: ~240° 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 +/- 6,400'.

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:

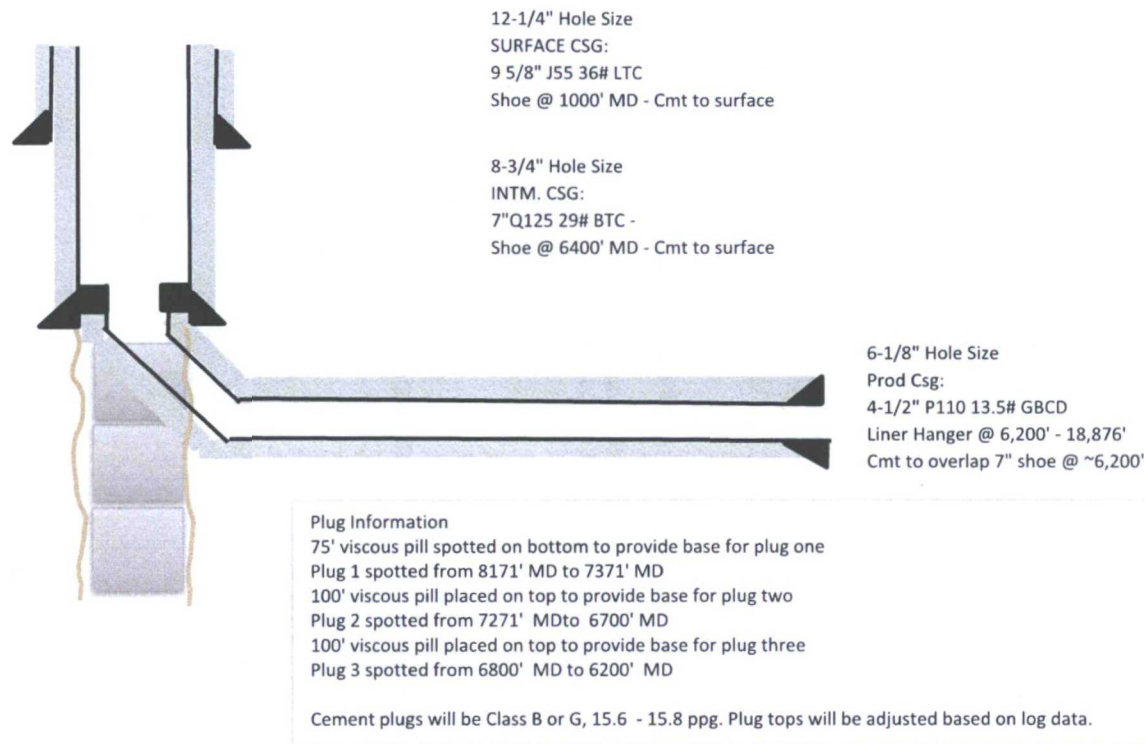
- **Pressure test**
 - Pressure test production casing to allowable frac pressure or as per BLM requirements
- **Stimulation**
 - well will be stimulated with approximately 35,000,000 pound of proppant in 775,000 bbls of water; the number of stages and the amount of proppant will be adjusted based on 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 60 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.

NEBU 605 Com-1H PILOT HOLE WBD



: After pilot hole has been drilled and open hole logging have been completed three cement plugs with viscous gel spacers will be pumped and the top of cement will be at ~6,200'. Will utilize cement plugs to kick off from and drill the production interval.



Company: B.P.
Project: San Juan County, NM NAD83
Site: NEBU 605 Pad
Well: NEBU 605 1H



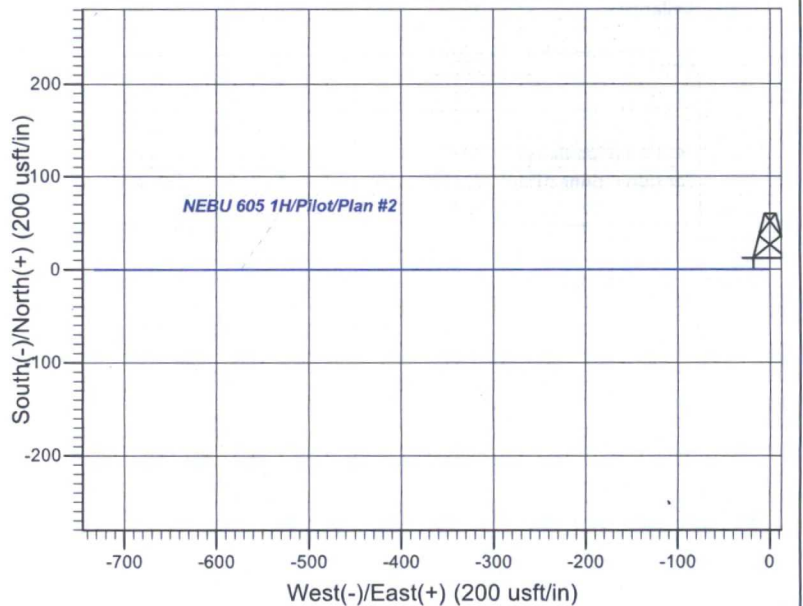
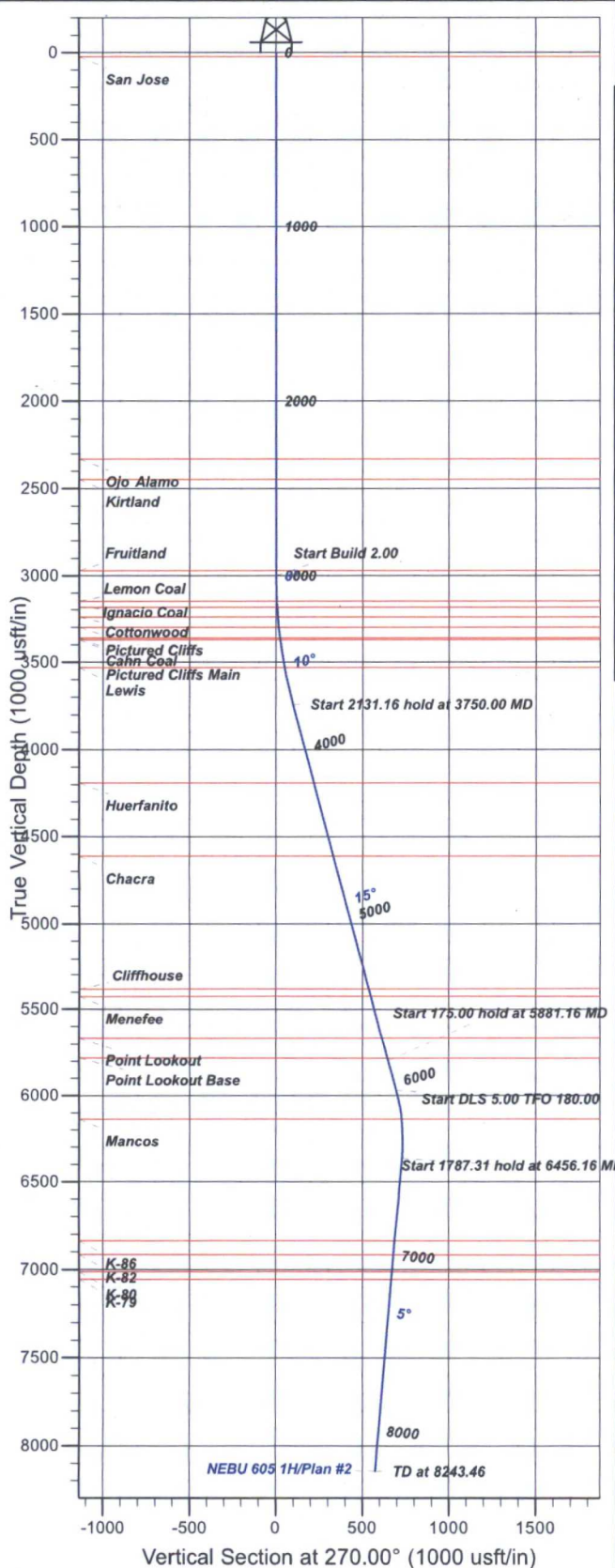
Well Details: NEBU 605 1H

GL 6471' & RKB 25' @ 6496.00usft (Aztec 1000)

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.00	0.00	2149972.24	2810585.35	36.9079896	-107.5340664	

Azimuths to Grid North
True North: -0.18°
Magnetic North: 8.89°

Magnetic Field
Strength: 50045.9snT
Dip Angle: 63.55°
Date: 6/26/2017
Model: HDGM



FORMATION TOP DETAILS

TVDPath	MDPath	Formation
25.00	25.00	San Jose
2331.00	2331.00	Ojo Alamo
2446.00	2446.00	Kirtland
2971.00	2971.00	Fruitland
3146.00	3146.06	Lemon Coal
3186.00	3186.13	Ignacio Coal
3241.00	3241.29	Cottonwood
3301.00	3301.56	Pictured Cliffs
3361.00	3361.96	Cahn Coal
3371.00	3372.04	Pictured Cliffs Main
3531.00	3534.09	Lewis
4191.00	4215.40	Huerfano
4611.00	4650.21	Chacra
5381.00	5447.37	Cliffhouse
5426.00	5493.96	Menefee
5666.00	5742.43	Point Lookout
5781.00	5861.49	Point Lookout Base
6136.00	6226.26	Mancos
6836.00	6928.46	K-86
6916.00	7008.76	K-82
7013.00	7106.13	K-80
7056.00	7149.30	K-79

Plan: Plan #2

17:36, July 19 2017

Created By: Mel Mireles Jr.

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

CASING DETAILS

No casing data is available

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSec	Target
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	3000.00	0.00	0.00	3000.00	0.00	0.00	0.00	0.00	0.00	
3	3750.00	15.00	270.00	3741.46	0.00	-97.62	2.00	270.00	97.62	
4	5881.16	15.00	270.00	5800.00	0.00	-649.20	0.00	0.00	649.20	
5	6056.16	15.00	270.00	5969.04	0.00	-694.49	0.00	0.00	694.49	
6	6456.16	5.00	90.00	6365.49	0.00	-729.18	5.00	180.00	729.18	
7	8243.46	5.00	90.00	8146.00	0.00	-573.40	0.00	0.00	573.40	

DESIGN TARGET DETAILS

No target data is available.

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	4.5	13.5	P110	GBCD	10,680	12,420	422,000	443,000
80% of Burst =						9,936		
	Casing Depth TVD	MW in	MW out	Pres in	Pres out	SF		
Collapse	7023	0.00	13.30	0	4857	2.20	Full evacuation with 13.3 ppg c annulus	
Burst	7023	9.0	0	1500	0	8.28	1500 psi casing test	
		Mud Wt	Air Wt	Bouy Wt	BW +100k			
Tension (Pipe Body)	7023	9.0	94,811	81,783	181,783	2.32	100k over pull	
Tension (Connection)	7023	9.0	94,811	81,783	181,783	2.44		
	BF= 1- (MW)/65.5 =		0.8626					



B.P.

San Juan County, NM NAD83

NEBU 605 Pad

NEBU 605 1H

Pilot

Plan: Plan #2

Standard Planning Report

19 July, 2017



www.scientificdrilling.com



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:	Pilot		
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	Pilot				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	6/26/2017	9.07	63.55	50,046

Design	Plan #2			
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	270.00

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	
3,000.00	0.00	0.00	3,000.00	0.00	0.00	0.00	0.00	0.00	0.00	
3,750.00	15.00	270.00	3,741.46	0.00	-97.62	2.00	2.00	0.00	270.00	
5,881.16	15.00	270.00	5,800.00	0.00	-649.20	0.00	0.00	0.00	0.00	
6,056.16	15.00	270.00	5,969.04	0.00	-694.49	0.00	0.00	0.00	0.00	
6,456.16	5.00	90.00	6,365.50	0.00	-729.18	5.00	-2.50	45.00	180.00	
8,243.46	5.00	90.00	8,146.00	0.00	-573.40	0.00	0.00	0.00	0.00	



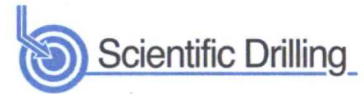
Database:	Grand Junction District	Local Co-ordinate Reference:	Well NEBU 605 1H
Company:	B.P.	TVD Reference:	GL 6471' & RKB 25' @ 6496.00usft (Aztec 1000)
Project:	San Juan County, NM NAD83	MD Reference:	GL 6471' & RKB 25' @ 6496.00usft (Aztec 1000)
Site:	NEBU 605 Pad	North Reference:	Grid
Well:	NEBU 605 1H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Pilot		
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)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25.00	0.00	0.00	25.00	0.00	0.00	0.00	0.00	0.00	0.00
San Jose									
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	0.00	0.00
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	0.00	0.00
1,000.00	0.00	0.00	1,000.00	0.00	0.00	0.00	0.00	0.00	0.00
1,100.00	0.00	0.00	1,100.00	0.00	0.00	0.00	0.00	0.00	0.00
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00
1,300.00	0.00	0.00	1,300.00	0.00	0.00	0.00	0.00	0.00	0.00
1,400.00	0.00	0.00	1,400.00	0.00	0.00	0.00	0.00	0.00	0.00
1,500.00	0.00	0.00	1,500.00	0.00	0.00	0.00	0.00	0.00	0.00
1,600.00	0.00	0.00	1,600.00	0.00	0.00	0.00	0.00	0.00	0.00
1,700.00	0.00	0.00	1,700.00	0.00	0.00	0.00	0.00	0.00	0.00
1,800.00	0.00	0.00	1,800.00	0.00	0.00	0.00	0.00	0.00	0.00
1,900.00	0.00	0.00	1,900.00	0.00	0.00	0.00	0.00	0.00	0.00
2,000.00	0.00	0.00	2,000.00	0.00	0.00	0.00	0.00	0.00	0.00
2,100.00	0.00	0.00	2,100.00	0.00	0.00	0.00	0.00	0.00	0.00
2,200.00	0.00	0.00	2,200.00	0.00	0.00	0.00	0.00	0.00	0.00
2,300.00	0.00	0.00	2,300.00	0.00	0.00	0.00	0.00	0.00	0.00
2,331.00	0.00	0.00	2,331.00	0.00	0.00	0.00	0.00	0.00	0.00
Ojo Alamo									
2,400.00	0.00	0.00	2,400.00	0.00	0.00	0.00	0.00	0.00	0.00
2,446.00	0.00	0.00	2,446.00	0.00	0.00	0.00	0.00	0.00	0.00
Kirtland									
2,500.00	0.00	0.00	2,500.00	0.00	0.00	0.00	0.00	0.00	0.00
2,600.00	0.00	0.00	2,600.00	0.00	0.00	0.00	0.00	0.00	0.00
2,700.00	0.00	0.00	2,700.00	0.00	0.00	0.00	0.00	0.00	0.00
2,800.00	0.00	0.00	2,800.00	0.00	0.00	0.00	0.00	0.00	0.00
2,900.00	0.00	0.00	2,900.00	0.00	0.00	0.00	0.00	0.00	0.00
2,971.00	0.00	0.00	2,971.00	0.00	0.00	0.00	0.00	0.00	0.00
Fruitland									
3,000.00	0.00	0.00	3,000.00	0.00	0.00	0.00	0.00	0.00	0.00
3,100.00	2.00	270.00	3,099.98	0.00	-1.75	1.75	2.00	2.00	0.00
3,146.06	2.92	270.00	3,146.00	0.00	-3.72	3.72	2.00	2.00	0.00
Lemon Coal									
3,186.13	3.72	270.00	3,186.00	0.00	-6.04	6.04	2.00	2.00	0.00
Ignacio Coal									
3,200.00	4.00	270.00	3,199.84	0.00	-6.98	6.98	2.00	2.00	0.00
3,241.29	4.83	270.00	3,241.00	0.00	-10.16	10.16	2.00	2.00	0.00
Cottonwood									
3,300.00	6.00	270.00	3,299.45	0.00	-15.69	15.69	2.00	2.00	0.00
3,301.56	6.03	270.00	3,301.00	0.00	-15.86	15.86	2.00	2.00	0.00
Pictured Cliffs									
3,361.96	7.24	270.00	3,361.00	0.00	-22.84	22.84	2.00	2.00	0.00



Planning Report



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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:	Pilot		
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)
Cahn Coal									
3,372.04	7.44	270.00	3,371.00	0.00	-24.12	24.12	2.00	2.00	0.00
Pictured Cliffs Main									
3,400.00	8.00	270.00	3,398.70	0.00	-27.88	27.88	2.00	2.00	0.00
3,500.00	10.00	270.00	3,497.47	0.00	-43.52	43.52	2.00	2.00	0.00
3,534.09	10.68	270.00	3,531.00	0.00	-49.64	49.64	2.00	2.00	0.00
Lewis									
3,600.00	12.00	270.00	3,595.62	0.00	-62.60	62.60	2.00	2.00	0.00
3,700.00	14.00	270.00	3,693.06	0.00	-85.10	85.10	2.00	2.00	0.00
3,750.00	15.00	270.00	3,741.46	0.00	-97.62	97.62	2.00	2.00	0.00
3,800.00	15.00	270.00	3,789.76	0.00	-110.56	110.56	0.00	0.00	0.00
3,900.00	15.00	270.00	3,886.35	0.00	-136.44	136.44	0.00	0.00	0.00
3,972.70	15.00	270.00	3,956.58	0.00	-155.26	155.26	0.00	0.00	0.00
NEBU 605 1H PBHL									
4,000.00	15.00	270.00	3,982.94	0.00	-162.32	162.32	0.00	0.00	0.00
4,100.00	15.00	270.00	4,079.54	0.00	-188.20	188.20	0.00	0.00	0.00
4,200.00	15.00	270.00	4,176.13	0.00	-214.08	214.08	0.00	0.00	0.00
4,215.40	15.00	270.00	4,191.00	0.00	-218.07	218.07	0.00	0.00	0.00
Huerfano									
4,300.00	15.00	270.00	4,272.72	0.00	-239.97	239.97	0.00	0.00	0.00
4,400.00	15.00	270.00	4,369.31	0.00	-265.85	265.85	0.00	0.00	0.00
4,500.00	15.00	270.00	4,465.91	0.00	-291.73	291.73	0.00	0.00	0.00
4,600.00	15.00	270.00	4,562.50	0.00	-317.61	317.61	0.00	0.00	0.00
4,650.21	15.00	270.00	4,611.00	0.00	-330.61	330.61	0.00	0.00	0.00
Chacra									
4,700.00	15.00	270.00	4,659.09	0.00	-343.49	343.49	0.00	0.00	0.00
4,800.00	15.00	270.00	4,755.68	0.00	-369.38	369.38	0.00	0.00	0.00
4,900.00	15.00	270.00	4,852.28	0.00	-395.26	395.26	0.00	0.00	0.00
5,000.00	15.00	270.00	4,948.87	0.00	-421.14	421.14	0.00	0.00	0.00
5,100.00	15.00	270.00	5,045.46	0.00	-447.02	447.02	0.00	0.00	0.00
5,200.00	15.00	270.00	5,142.05	0.00	-472.90	472.90	0.00	0.00	0.00
5,300.00	15.00	270.00	5,238.65	0.00	-498.78	498.78	0.00	0.00	0.00
5,400.00	15.00	270.00	5,335.24	0.00	-524.67	524.67	0.00	0.00	0.00
5,447.37	15.00	270.00	5,381.00	0.00	-536.93	536.93	0.00	0.00	0.00
Cliffhouse									
5,493.96	15.00	270.00	5,426.00	0.00	-548.99	548.99	0.00	0.00	0.00
Menefee									
5,500.00	15.00	270.00	5,431.83	0.00	-550.55	550.55	0.00	0.00	0.00
5,600.00	15.00	270.00	5,528.42	0.00	-576.43	576.43	0.00	0.00	0.00
5,700.00	15.00	270.00	5,625.02	0.00	-602.31	602.31	0.00	0.00	0.00
5,742.43	15.00	270.00	5,666.00	0.00	-613.29	613.29	0.00	0.00	0.00
Point Lookout									
5,800.00	15.00	270.00	5,721.61	0.00	-628.19	628.19	0.00	0.00	0.00
5,861.49	15.00	270.00	5,781.00	0.00	-644.11	644.11	0.00	0.00	0.00
Point Lookout Base									
5,881.16	15.00	270.00	5,800.00	0.00	-649.20	649.20	0.00	0.00	0.00
5,900.00	15.00	270.00	5,818.20	0.00	-654.08	654.08	0.00	0.00	0.00
6,000.00	15.00	270.00	5,914.80	0.00	-679.96	679.96	0.00	0.00	0.00
6,056.16	15.00	270.00	5,969.04	0.00	-694.49	694.49	0.00	0.00	0.00
6,100.00	12.81	270.00	6,011.59	0.00	-705.03	705.03	5.00	-5.00	0.00
6,200.00	7.81	270.00	6,109.95	0.00	-722.92	722.92	5.00	-5.00	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:	Pilot		
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)
6,226.26	6.49	270.00	6,136.00	0.00	-726.18	726.18	5.00	-5.00	0.00
Mancos									
6,300.00	2.81	270.00	6,209.49	0.00	-732.16	732.16	5.00	-5.00	0.00
6,400.00	2.19	90.00	6,309.46	0.00	-732.70	732.70	5.00	-0.62	180.00
6,456.16	5.00	90.00	6,365.50	0.00	-729.18	729.18	5.00	5.00	0.00
6,500.00	5.00	90.00	6,409.17	0.00	-725.36	725.36	0.00	0.00	0.00
6,600.00	5.00	90.00	6,508.79	0.00	-716.64	716.64	0.00	0.00	0.00
6,700.00	5.00	90.00	6,608.41	0.00	-707.93	707.93	0.00	0.00	0.00
6,800.00	5.00	90.00	6,708.03	0.00	-699.21	699.21	0.00	0.00	0.00
6,900.00	5.00	90.00	6,807.65	0.00	-690.49	690.49	0.00	0.00	0.00
6,928.46	5.00	90.00	6,836.00	0.00	-688.01	688.01	0.00	0.00	0.00
K-86									
7,000.00	5.00	90.00	6,907.27	0.00	-681.78	681.78	0.00	0.00	0.00
7,008.76	5.00	90.00	6,916.00	0.00	-681.01	681.01	0.00	0.00	0.00
K-82									
7,100.00	5.00	90.00	7,006.89	0.00	-673.06	673.06	0.00	0.00	0.00
7,106.13	5.00	90.00	7,013.00	0.00	-672.53	672.53	0.00	0.00	0.00
K-80									
7,149.30	5.00	90.00	7,056.00	0.00	-668.77	668.77	0.00	0.00	0.00
K-79									
7,200.00	5.00	90.00	7,106.51	0.00	-664.35	664.35	0.00	0.00	0.00
7,300.00	5.00	90.00	7,206.13	0.00	-655.63	655.63	0.00	0.00	0.00
7,306.77	5.00	90.00	7,212.88	0.00	-655.04	655.04	0.00	0.00	0.00
NEBU 605 1H LP									
7,400.00	5.00	90.00	7,305.75	0.00	-646.92	646.92	0.00	0.00	0.00
7,500.00	5.00	90.00	7,405.37	0.00	-638.20	638.20	0.00	0.00	0.00
7,600.00	5.00	90.00	7,504.99	0.00	-629.49	629.49	0.00	0.00	0.00
7,700.00	5.00	90.00	7,604.61	0.00	-620.77	620.77	0.00	0.00	0.00
7,800.00	5.00	90.00	7,704.23	0.00	-612.05	612.05	0.00	0.00	0.00
7,900.00	5.00	90.00	7,803.85	0.00	-603.34	603.34	0.00	0.00	0.00
8,000.00	5.00	90.00	7,903.46	0.00	-594.62	594.62	0.00	0.00	0.00
8,100.00	5.00	90.00	8,003.08	0.00	-585.91	585.91	0.00	0.00	0.00
8,200.00	5.00	90.00	8,102.70	0.00	-577.19	577.19	0.00	0.00	0.00
8,243.46	5.00	90.00	8,146.00	0.00	-573.40	573.40	0.00	0.00	0.00

Design Targets

Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
NEBU 605 1H PBHL	0.00	0.00	7,023.00	25.00	11,288.79	2,149,997.24	2,821,874.14	36.9079547	-107.4954540
- hit/miss target									
- Shape									
- plan misses target center by 11847.77usft at 3972.70usft MD (3956.58 TVD, 0.00 N, -155.26 E)									
- Point									
NEBU 605 1H LP	0.00	0.00	7,023.00	1.19	1,515.25	2,149,973.43	2,812,100.60	36.9079797	-107.5288836
- plan misses target center by 2178.58usft at 7306.77usft MD (7212.88 TVD, 0.00 N, -655.04 E)									
- Point									



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:	Pilot		
Design:	Plan #2		

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
25.00	25.00	San Jose		0.00	0.00
2,331.00	2,331.00	Ojo Alamo		0.00	0.00
2,446.00	2,446.00	Kirtland		0.00	0.00
2,971.00	2,971.00	Fruitland		0.00	0.00
3,146.06	3,146.00	Lemon Coal		0.00	0.00
3,186.13	3,186.00	Ignacio Coal		0.00	0.00
3,241.29	3,241.00	Cottonwood		0.00	0.00
3,301.56	3,301.00	Pictured Cliffs		0.00	0.00
3,361.96	3,361.00	Cahn Coal		0.00	0.00
3,372.04	3,371.00	Pictured Cliffs Main		0.00	0.00
3,534.09	3,531.00	Lewis		0.00	0.00
4,215.40	4,191.00	Huerfano		0.00	0.00
4,650.21	4,611.00	Chacra		0.00	0.00
5,447.37	5,381.00	Cliffhouse		0.00	0.00
5,493.96	5,426.00	Menefee		0.00	0.00
5,742.43	5,666.00	Point Lookout		0.00	0.00
5,861.49	5,781.00	Point Lookout Base		0.00	0.00
6,226.26	6,136.00	Mancos		0.00	0.00
6,928.46	6,836.00	K-86		0.00	0.00
7,008.76	6,916.00	K-82		0.00	0.00
7,106.13	7,013.00	K-80		0.00	0.00
7,149.30	7,056.00	K-79		0.00	0.00



Company: B.P.
Project: San Juan County, NM NAD83
Site: NEBU 605 Pad
Well: NEBU 605 1H
Wellbore: Lateral
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



Scientific Drilling



Azimuths to Grid North
True North: -0.18°
Magnetic North: 8.89°

Magnetic Field
Strength: 50042.8nT
Dip Angle: 63.55°
Date: 7/6/2017
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)

Created By: Janie Collins Date: 17:46, July 19 2017

DESIGN TARGET DETAILS

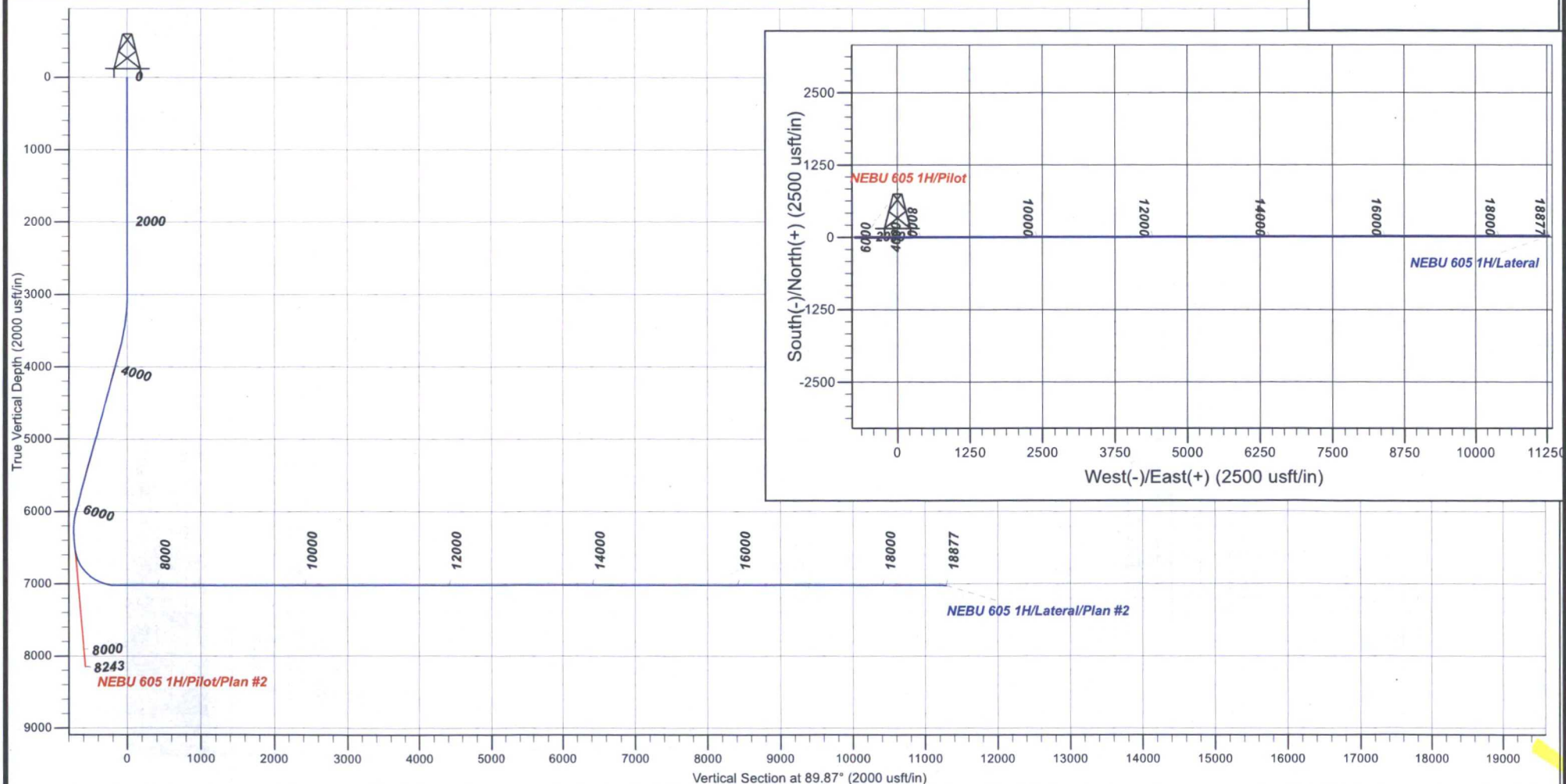
Name	TVD	+N/-S	+E/-W	Northing	Easting
NEBU 605 1H PBHL	7023.00	25.00	11288.79	2149997.24	2821874.14
NEBU 605 1H LP	7023.00	1.19	1515.25	2149973.43	2821200.60

SECTION DETAILS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Target
6591.15	5.00	90.00	6499.98	0.00	-717.41	0.00	0.00	-717.41	
7441.15	90.00	89.88	7023.00	1.10	-146.64	10.00	-0.12	-146.63	
18876.60	90.00	89.88	7023.00	25.00	11288.79	0.00	0.00	11288.82	NEBU 605 1H PBHL

FORMATION TOP DETAILS

No formation data is available





B.P.

San Juan County, NM NAD83

NEBU 605 Pad

NEBU 605 1H

Lateral

Plan: Plan #2

Standard Planning Report

19 July, 2017



Scientific Drilling

www.scientificdrilling.com





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		
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
From:	Map	Easting:	2,810,585.35 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13.20 in
		Latitude:	36.9079896
		Longitude:	-107.5340664
		Grid Convergence:	0.18 °

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

Wellbore	Lateral		
Magnetics	Model Name	Sample Date	Declination
			(°)
	HDGM	7/6/2017	9.07
			Dip Angle
			(°)
			63.55
			Field Strength
			(nT)
			50,043

Design	Plan #2		
Audit Notes:			
Version:	Phase:	PLAN	Tie On Depth:
			6,591.15
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W
	(usft)	(usft)	(usft)
	0.00	0.00	0.00
			Direction
			(°)
			89.87

Plan Sections										
Measured Depth	Inclination	Azimuth	Vertical Depth	+N/-S	+E/-W	Dogleg Rate	Build Rate	Turn Rate	TFO	Target
(usft)	(°)	(°)	(usft)	(usft)	(usft)	(°/100usft)	(°/100usft)	(°/100usft)	(°)	
6,591.15	5.00	90.00	6,499.98	0.00	-717.41	0.00	0.00	0.00	0.00	
7,441.15	90.00	89.88	7,023.00	1.10	-146.64	10.00	10.00	-0.01	-0.12	
18,876.60	90.00	89.88	7,023.00	25.00	11,288.79	0.00	0.00	0.00	0.00	NEBU 605 1H PBHL



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		
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)
6,591.15	5.00	90.00	6,499.98	0.00	-717.41	-717.41	0.00	0.00	0.00
6,600.00	5.88	89.98	6,508.79	0.00	-716.57	-716.57	10.00	10.00	-0.20
6,700.00	15.88	89.92	6,606.86	0.02	-697.71	-697.71	10.00	10.00	-0.06
6,800.00	25.88	89.90	6,700.17	0.08	-662.11	-662.11	10.00	10.00	-0.02
6,900.00	35.88	89.89	6,785.88	0.17	-610.84	-610.84	10.00	10.00	-0.01
7,000.00	45.88	89.89	6,861.39	0.29	-545.47	-545.47	10.00	10.00	0.00
7,100.00	55.88	89.89	6,924.40	0.44	-467.98	-467.98	10.00	10.00	0.00
7,200.00	65.88	89.88	6,972.99	0.62	-380.73	-380.73	10.00	10.00	0.00
7,300.00	75.88	89.88	7,005.70	0.81	-286.36	-286.36	10.00	10.00	0.00
7,400.00	85.88	89.88	7,021.52	1.01	-187.75	-187.75	10.00	10.00	0.00
7,441.15	90.00	89.88	7,023.00	1.10	-146.64	-146.63	10.00	10.00	0.00
7,500.00	90.00	89.88	7,023.00	1.22	-87.79	-87.78	0.00	0.00	0.00
7,600.00	90.00	89.88	7,023.00	1.43	12.21	12.22	0.00	0.00	0.00
7,700.00	90.00	89.88	7,023.00	1.64	112.21	112.22	0.00	0.00	0.00
7,800.00	90.00	89.88	7,023.00	1.85	212.21	212.22	0.00	0.00	0.00
7,900.00	90.00	89.88	7,023.00	2.06	312.21	312.22	0.00	0.00	0.00
8,000.00	90.00	89.88	7,023.00	2.27	412.21	412.22	0.00	0.00	0.00
8,100.00	90.00	89.88	7,023.00	2.47	512.21	512.22	0.00	0.00	0.00
8,200.00	90.00	89.88	7,023.00	2.68	612.21	612.22	0.00	0.00	0.00
8,300.00	90.00	89.88	7,023.00	2.89	712.21	712.22	0.00	0.00	0.00
8,400.00	90.00	89.88	7,023.00	3.10	812.21	812.22	0.00	0.00	0.00
8,500.00	90.00	89.88	7,023.00	3.31	912.21	912.22	0.00	0.00	0.00
8,600.00	90.00	89.88	7,023.00	3.52	1,012.21	1,012.22	0.00	0.00	0.00
8,700.00	90.00	89.88	7,023.00	3.73	1,112.21	1,112.22	0.00	0.00	0.00
8,800.00	90.00	89.88	7,023.00	3.94	1,212.21	1,212.22	0.00	0.00	0.00
8,900.00	90.00	89.88	7,023.00	4.15	1,312.21	1,312.22	0.00	0.00	0.00
9,000.00	90.00	89.88	7,023.00	4.36	1,412.21	1,412.22	0.00	0.00	0.00
9,100.00	90.00	89.88	7,023.00	4.56	1,512.21	1,512.22	0.00	0.00	0.00
9,103.03	90.00	89.88	7,023.00	4.57	1,515.24	1,515.25	0.00	0.00	0.00
NEBU 605 1H LP									
9,200.00	90.00	89.88	7,023.00	4.77	1,612.21	1,612.22	0.00	0.00	0.00
9,300.00	90.00	89.88	7,023.00	4.98	1,712.21	1,712.22	0.00	0.00	0.00
9,400.00	90.00	89.88	7,023.00	5.19	1,812.21	1,812.22	0.00	0.00	0.00
9,500.00	90.00	89.88	7,023.00	5.40	1,912.21	1,912.22	0.00	0.00	0.00
9,600.00	90.00	89.88	7,023.00	5.61	2,012.21	2,012.22	0.00	0.00	0.00
9,700.00	90.00	89.88	7,023.00	5.82	2,112.21	2,112.22	0.00	0.00	0.00
9,800.00	90.00	89.88	7,023.00	6.03	2,212.21	2,212.22	0.00	0.00	0.00
9,900.00	90.00	89.88	7,023.00	6.24	2,312.21	2,312.22	0.00	0.00	0.00
10,000.00	90.00	89.88	7,023.00	6.45	2,412.21	2,412.22	0.00	0.00	0.00
10,100.00	90.00	89.88	7,023.00	6.65	2,512.21	2,512.22	0.00	0.00	0.00
10,200.00	90.00	89.88	7,023.00	6.86	2,612.21	2,612.22	0.00	0.00	0.00
10,300.00	90.00	89.88	7,023.00	7.07	2,712.21	2,712.22	0.00	0.00	0.00
10,400.00	90.00	89.88	7,023.00	7.28	2,812.21	2,812.22	0.00	0.00	0.00
10,500.00	90.00	89.88	7,023.00	7.49	2,912.21	2,912.22	0.00	0.00	0.00
10,600.00	90.00	89.88	7,023.00	7.70	3,012.21	3,012.22	0.00	0.00	0.00
10,700.00	90.00	89.88	7,023.00	7.91	3,112.21	3,112.22	0.00	0.00	0.00
10,800.00	90.00	89.88	7,023.00	8.12	3,212.21	3,212.22	0.00	0.00	0.00
10,900.00	90.00	89.88	7,023.00	8.33	3,312.21	3,312.22	0.00	0.00	0.00
11,000.00	90.00	89.88	7,023.00	8.54	3,412.21	3,412.22	0.00	0.00	0.00
11,100.00	90.00	89.88	7,023.00	8.75	3,512.21	3,512.22	0.00	0.00	0.00
11,200.00	90.00	89.88	7,023.00	8.95	3,612.21	3,612.22	0.00	0.00	0.00
11,300.00	90.00	89.88	7,023.00	9.16	3,712.21	3,712.22	0.00	0.00	0.00



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		
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)
11,400.00	90.00	89.88	7,023.00	9.37	3,812.21	3,812.22	0.00	0.00	0.00
11,500.00	90.00	89.88	7,023.00	9.58	3,912.21	3,912.22	0.00	0.00	0.00
11,600.00	90.00	89.88	7,023.00	9.79	4,012.21	4,012.22	0.00	0.00	0.00
11,700.00	90.00	89.88	7,023.00	10.00	4,112.20	4,112.22	0.00	0.00	0.00
11,800.00	90.00	89.88	7,023.00	10.21	4,212.20	4,212.22	0.00	0.00	0.00
11,900.00	90.00	89.88	7,023.00	10.42	4,312.20	4,312.22	0.00	0.00	0.00
12,000.00	90.00	89.88	7,023.00	10.63	4,412.20	4,412.22	0.00	0.00	0.00
12,100.00	90.00	89.88	7,023.00	10.84	4,512.20	4,512.22	0.00	0.00	0.00
12,200.00	90.00	89.88	7,023.00	11.04	4,612.20	4,612.22	0.00	0.00	0.00
12,300.00	90.00	89.88	7,023.00	11.25	4,712.20	4,712.22	0.00	0.00	0.00
12,400.00	90.00	89.88	7,023.00	11.46	4,812.20	4,812.22	0.00	0.00	0.00
12,500.00	90.00	89.88	7,023.00	11.67	4,912.20	4,912.22	0.00	0.00	0.00
12,600.00	90.00	89.88	7,023.00	11.88	5,012.20	5,012.22	0.00	0.00	0.00
12,700.00	90.00	89.88	7,023.00	12.09	5,112.20	5,112.22	0.00	0.00	0.00
12,800.00	90.00	89.88	7,023.00	12.30	5,212.20	5,212.22	0.00	0.00	0.00
12,900.00	90.00	89.88	7,023.00	12.51	5,312.20	5,312.22	0.00	0.00	0.00
13,000.00	90.00	89.88	7,023.00	12.72	5,412.20	5,412.22	0.00	0.00	0.00
13,100.00	90.00	89.88	7,023.00	12.93	5,512.20	5,512.22	0.00	0.00	0.00
13,200.00	90.00	89.88	7,023.00	13.13	5,612.20	5,612.22	0.00	0.00	0.00
13,300.00	90.00	89.88	7,023.00	13.34	5,712.20	5,712.22	0.00	0.00	0.00
13,400.00	90.00	89.88	7,023.00	13.55	5,812.20	5,812.22	0.00	0.00	0.00
13,500.00	90.00	89.88	7,023.00	13.76	5,912.20	5,912.22	0.00	0.00	0.00
13,600.00	90.00	89.88	7,023.00	13.97	6,012.20	6,012.22	0.00	0.00	0.00
13,700.00	90.00	89.88	7,023.00	14.18	6,112.20	6,112.22	0.00	0.00	0.00
13,800.00	90.00	89.88	7,023.00	14.39	6,212.20	6,212.22	0.00	0.00	0.00
13,900.00	90.00	89.88	7,023.00	14.60	6,312.20	6,312.22	0.00	0.00	0.00
14,000.00	90.00	89.88	7,023.00	14.81	6,412.20	6,412.22	0.00	0.00	0.00
14,100.00	90.00	89.88	7,023.00	15.02	6,512.20	6,512.22	0.00	0.00	0.00
14,200.00	90.00	89.88	7,023.00	15.22	6,612.20	6,612.22	0.00	0.00	0.00
14,300.00	90.00	89.88	7,023.00	15.43	6,712.20	6,712.22	0.00	0.00	0.00
14,400.00	90.00	89.88	7,023.00	15.64	6,812.20	6,812.22	0.00	0.00	0.00
14,500.00	90.00	89.88	7,023.00	15.85	6,912.20	6,912.22	0.00	0.00	0.00
14,600.00	90.00	89.88	7,023.00	16.06	7,012.20	7,012.22	0.00	0.00	0.00
14,700.00	90.00	89.88	7,023.00	16.27	7,112.20	7,112.22	0.00	0.00	0.00
14,800.00	90.00	89.88	7,023.00	16.48	7,212.20	7,212.22	0.00	0.00	0.00
14,900.00	90.00	89.88	7,023.00	16.69	7,312.20	7,312.22	0.00	0.00	0.00
15,000.00	90.00	89.88	7,023.00	16.90	7,412.20	7,412.22	0.00	0.00	0.00
15,100.00	90.00	89.88	7,023.00	17.11	7,512.20	7,512.22	0.00	0.00	0.00
15,200.00	90.00	89.88	7,023.00	17.32	7,612.20	7,612.22	0.00	0.00	0.00
15,300.00	90.00	89.88	7,023.00	17.52	7,712.20	7,712.22	0.00	0.00	0.00
15,400.00	90.00	89.88	7,023.00	17.73	7,812.20	7,812.22	0.00	0.00	0.00
15,500.00	90.00	89.88	7,023.00	17.94	7,912.20	7,912.22	0.00	0.00	0.00
15,600.00	90.00	89.88	7,023.00	18.15	8,012.20	8,012.22	0.00	0.00	0.00
15,700.00	90.00	89.88	7,023.00	18.36	8,112.20	8,112.22	0.00	0.00	0.00
15,800.00	90.00	89.88	7,023.00	18.57	8,212.20	8,212.22	0.00	0.00	0.00
15,900.00	90.00	89.88	7,023.00	18.78	8,312.20	8,312.22	0.00	0.00	0.00
16,000.00	90.00	89.88	7,023.00	18.99	8,412.20	8,412.22	0.00	0.00	0.00
16,100.00	90.00	89.88	7,023.00	19.20	8,512.20	8,512.22	0.00	0.00	0.00
16,200.00	90.00	89.88	7,023.00	19.41	8,612.20	8,612.22	0.00	0.00	0.00
16,300.00	90.00	89.88	7,023.00	19.61	8,712.19	8,712.22	0.00	0.00	0.00
16,400.00	90.00	89.88	7,023.00	19.82	8,812.19	8,812.22	0.00	0.00	0.00
16,500.00	90.00	89.88	7,023.00	20.03	8,912.19	8,912.22	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		
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)
16,600.00	90.00	89.88	7,023.00	20.24	9,012.19	9,012.22	0.00	0.00	0.00
16,700.00	90.00	89.88	7,023.00	20.45	9,112.19	9,112.22	0.00	0.00	0.00
16,800.00	90.00	89.88	7,023.00	20.66	9,212.19	9,212.22	0.00	0.00	0.00
16,900.00	90.00	89.88	7,023.00	20.87	9,312.19	9,312.22	0.00	0.00	0.00
17,000.00	90.00	89.88	7,023.00	21.08	9,412.19	9,412.22	0.00	0.00	0.00
17,100.00	90.00	89.88	7,023.00	21.29	9,512.19	9,512.22	0.00	0.00	0.00
17,200.00	90.00	89.88	7,023.00	21.50	9,612.19	9,612.22	0.00	0.00	0.00
17,300.00	90.00	89.88	7,023.00	21.70	9,712.19	9,712.22	0.00	0.00	0.00
17,400.00	90.00	89.88	7,023.00	21.91	9,812.19	9,812.22	0.00	0.00	0.00
17,500.00	90.00	89.88	7,023.00	22.12	9,912.19	9,912.22	0.00	0.00	0.00
17,600.00	90.00	89.88	7,023.00	22.33	10,012.19	10,012.22	0.00	0.00	0.00
17,700.00	90.00	89.88	7,023.00	22.54	10,112.19	10,112.22	0.00	0.00	0.00
17,800.00	90.00	89.88	7,023.00	22.75	10,212.19	10,212.22	0.00	0.00	0.00
17,900.00	90.00	89.88	7,023.00	22.96	10,312.19	10,312.22	0.00	0.00	0.00
18,000.00	90.00	89.88	7,023.00	23.17	10,412.19	10,412.22	0.00	0.00	0.00
18,100.00	90.00	89.88	7,023.00	23.38	10,512.19	10,512.22	0.00	0.00	0.00
18,200.00	90.00	89.88	7,023.00	23.59	10,612.19	10,612.22	0.00	0.00	0.00
18,300.00	90.00	89.88	7,023.00	23.79	10,712.19	10,712.22	0.00	0.00	0.00
18,400.00	90.00	89.88	7,023.00	24.00	10,812.19	10,812.22	0.00	0.00	0.00
18,500.00	90.00	89.88	7,023.00	24.21	10,912.19	10,912.22	0.00	0.00	0.00
18,600.00	90.00	89.88	7,023.00	24.42	11,012.19	11,012.22	0.00	0.00	0.00
18,700.00	90.00	89.88	7,023.00	24.63	11,112.19	11,112.22	0.00	0.00	0.00
18,800.00	90.00	89.88	7,023.00	24.84	11,212.19	11,212.22	0.00	0.00	0.00
18,876.60	90.00	89.88	7,023.00	25.00	11,288.79	11,288.82	0.00	0.00	0.00

NEBU 605 1H PBHL

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 605 1H PBHL - plan hits target center - Point	0.00	0.00	7,023.00	25.00	11,288.79	2,149,997.24	2,821,874.14	36.9079547	-107.4954540
NEBU 605 1H LP - plan misses target center by 3.38usft at 9103.03usft MD (7023.00 TVD, 4.57 N, 1515.24 E) - Point	0.00	0.00	7,023.00	1.19	1,515.25	2,149,973.43	2,812,100.60	36.9079797	-107.5288836