

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: 6.17.16

Well information;

Operator DP, Well Name and Number NEBU 602 COM#2H

API# 30.045.3577, Section 12, Township 31 N/S, Range 7 E/W

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 *Submit sundry to extend surface casing to 320'*
- ☐ 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.

Charles H. Sayer
NMOCD Approved by Signature

1-20-2017
Date

Actual
Lessee - BP/Burlington
made 5/13/16

Form 3160-3
(March 2012)

NOS: 5/16/16
ADOP: 5
MP: BLM
SMA: WY2924
BOND: WY2924
CMT: pending

10400002274
ATS-F010-16-144

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

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL OR REENTER

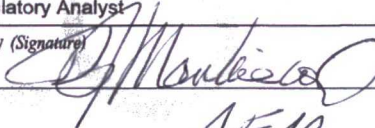
1a. Type of work: ☒ DRILL ☐ REENTER		5. Lease Serial No. NMNM03358
1b. Type of Well: ☐ Oil Well ☒ Gas Well ☐ Other ☐ Single Zone ☒ Multiple Zone		6. If Indian, Allottee or Tribe Name
2. Name of Operator BP AMERICA PROD CO		7. If Unit or CA Agreement, Name and No.
3a. Address 737 North Eldridge Pkwy Houston TX 77079		8. Lease Name and Well No. NEBU 602 COM / 2H
3b. Phone No. (include area code) (281)366-7148		9. API Well No. 30-045-35777
4. Location of Well (Report location clearly and in accordance with any State requirements. *) At surface ☒ NWNW / 642 FNL / 732 FWL / LAT 36.919514 / LONG -107.52879 At proposed prod. zone ☒ NWNW / 710 FNL / 710 FWL / LAT 36.919316 / LONG -107.546916		10. Field and Pool, or Exploratory BASIN MANCOS
14. Distance in miles and direction from nearest town or post office* 27.1 miles		11. Sec., T. R. M. or Blk. and Survey or Area SEC 12 / T31N / R07W / NMP
15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. unit line, if any) 50 feet	16. No. of acres in lease 2396.77	12. County or Parish SAN JUAN
17. Spacing Unit dedicated to this well 320	18. Distance from proposed location* to nearest well, drilling, completed, 1574 feet applied for, on this lease, ft.	13. State NM
19. Proposed Depth 7246 feet / 12169 feet	20. BLM/BIA Bond No. on file FED: WY2924	
21. Elevations (Show whether DF, KDB, RT, GL, etc.) 6521 feet	22. Approximate date work will start* 06/01/2017	
23. Estimated duration 30 days		
24. Attachments		

OIL CONS. DIV DIST. 3

DEC 22 2016

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

- Well plat certified by a registered surveyor.
- A Drilling Plan.
- A Surface Use Plan (if the location is on National Forest System Lands, the SUPO must be filed with the appropriate Forest Service Office).
- Bond to cover the operations unless covered by an existing bond on file (see Item 20 above).
- Operator certification
- 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 06/17/2016
Title Regulatory Analyst		
Approved by (Signature) 	Name (Printed/Typed) AFN	Date 12/28/16
Title 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)

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

NMOCD

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

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

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 30-045-35777		² Pool Code 97232		³ Pool Name Mancos Gas	
⁴ Property Code 317302		⁵ Property Name Northeast Blanco Unit 602 Com			⁶ Well Number 2H
⁷ OGRID No. 000778		⁸ Operator Name BP America Production Company			⁹ Elevation 6521

¹⁰ Surface Location

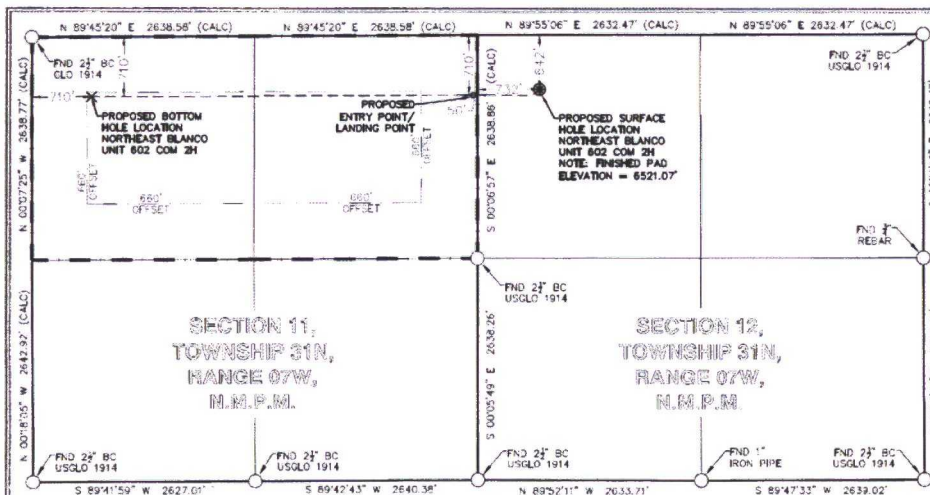
UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
D	12	31N	07W		642	North	732	West	San Juan

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
D	11	31N	07W		710	North	710	West	San Juan

¹² Dedicated Acres 320 N/2—SEC. 11	¹³ Joint or Infill	¹⁴ Consolidation Code	¹⁵ Order No.
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No allowable will be assigned to this completion until all interests have been consolidated or a non-standard unit has been approved by the division.



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

NEBU 602 COM 2H	NMWZ NAD'83	NAD'83	TIES
PROPOSED SURFACE HOLE LOCATION (SHL)	N (Y) = 2,154,173.10' E (X) = 2,812,114.51'	LAT. = 36.91951497°N LON. = 107.52879016°W	FNL = 642' FWL = 732'
PROPOSED ENTRY POINT (EP)/ LANDING POINT (LP)	N (Y) = 2,154,103.55' E (X) = 2,811,332.97'	LAT. = 36.91933076°N LON. = 107.53146449°W	FNL = 710' FEL = 50'
PROPOSED BOTTOM HOLE LOCATION (BHL)	N (Y) = 2,154,084.28' E (X) = 2,806,815.95'	LAT. = 36.91931609°N LON. = 107.54691699°W	FNL = 710' FWL = 710'

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 released 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 in the division.

Toya Colvin 4/14/16
Signature Date

Toya Colvin

Printed Name

toya.colvin@bp.com

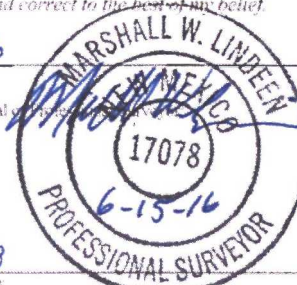
E-mail Address

¹⁸ SURVEYOR CERTIFICATION

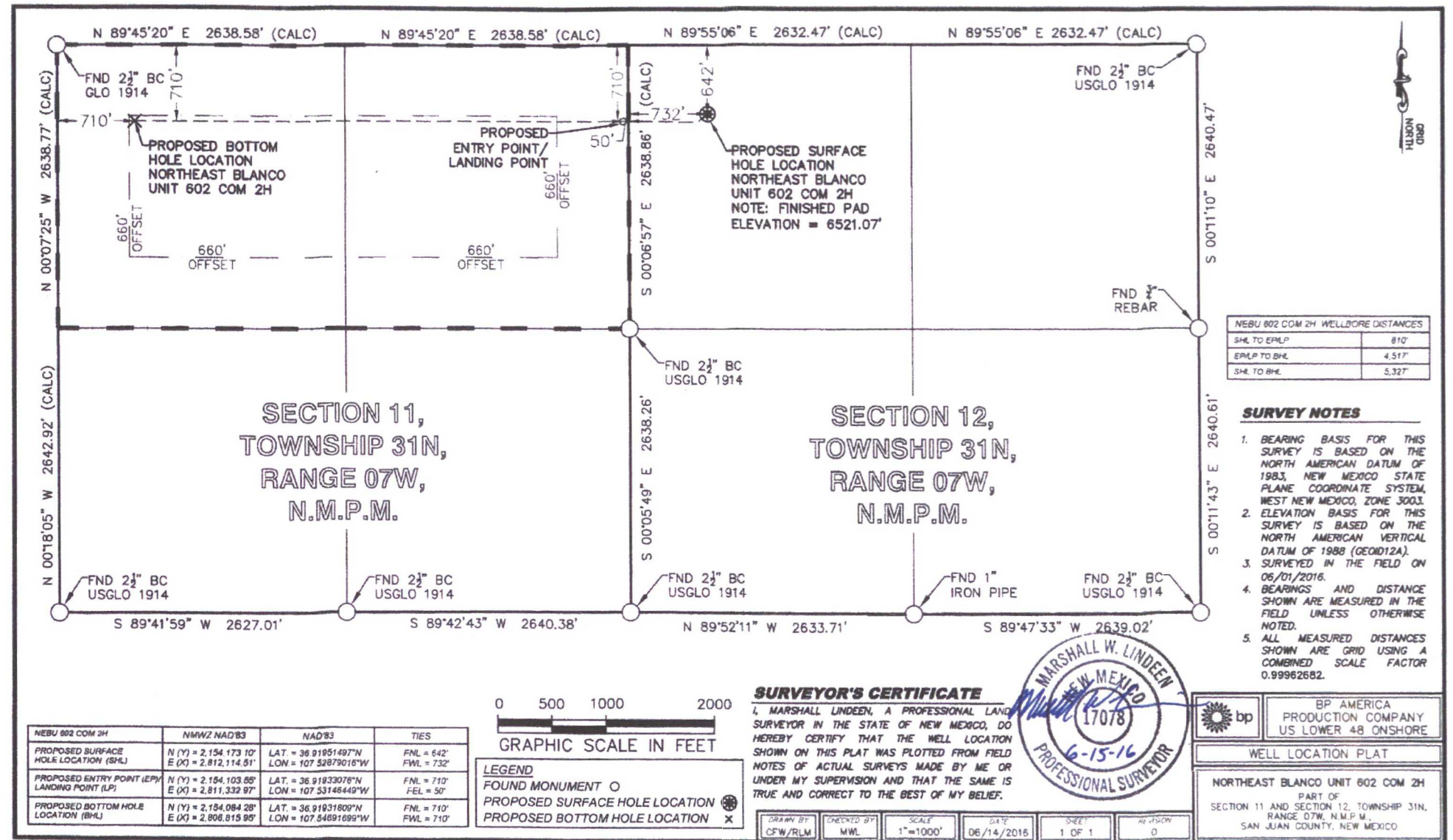
I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief.

6-1-16
Date of Survey

Signature and Seal of Surveyor



17078
Certificate Number



SECTION – 1 – GEOLOGIC FORMATIONS AND CONTENTS

Marker	TVD	MD	Comments	BHP PSI/FT
Tertiary/San Jose Ss	15	15	Wet/aquifer	0.43
Ojo Alamo Ss	2,391	2,391	wet/aquifer	0.43
Kirtland (Top/Cretaceous)	2,496	2,496	Gas & water-bearing	0.43
Fruitland	2,981	2,981	Gas & water-bearing	0.15
Fruitland Coal	3,036	3,036	Gas & water-bearing	0.07
Ignacio coal zone	3,186	3,186	Gas & water-bearing	0.07
Pictured Cliffs Ss	3,281	3,281	Wet	0.12
Cotton Wood Coal	3,426	3,426	Gas & water-bearing	0.12
Cahn Coal	3,210	3,210	Gas & water-bearing	0.35
Lewis Sh	3,576	3,576	Gas & water-bearing	0.35
Huerfano Bentonite	4,266	4,266	Gas & water-bearing	0.35
Chacra Ss	4,696	4,696	Gas & water-bearing	0.35
Cliffhouse Ss	5,136	5,136	Gas- & water-bearing	0.35
Menefee	5,501	5,501	Gas- & water-bearing	0.30
Point Lookout SS	5,771	5,772	Gas-bearing	0.30
Point Lookout Base	5,861	5,862	Gas-bearing	0.30
Mancos sh	6,181	6,182	Gas-bearing	0.43
K-89 marker	6,911	6,927	Gas-bearing	0.43
K-82 marker	6,986	7,018	Gas-bearing	0.43
"Upper Gallup"	7,086	7,160	Gas-bearing	0.43
K-78_0 marker	7,206	7,396	Gas-bearing	0.43

Possible Aquifers: San Jose and Ojo Alamo

Oil Shale: None Expected.

Oil & Gas: Primary objective is the Mancos formation from 7,256' TVD (heel) to 7,246' TVD (toe). Landing point is expected to be in the Mancos at 7,256' TVD.

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

SECTION – 2 BOPE

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

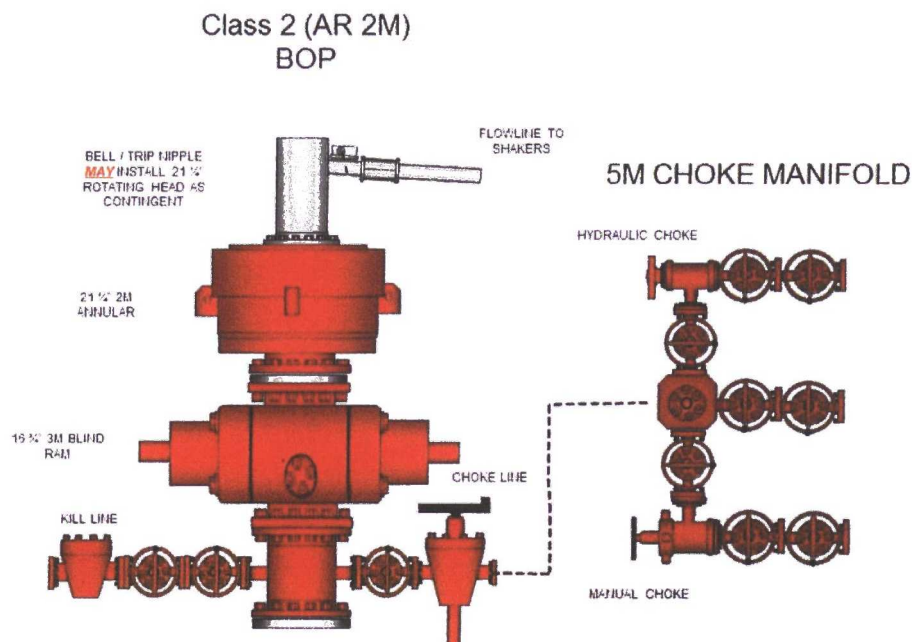
A 16 3/4" 2M BOPE and 13 5/8" 5M BOPE will be utilized to drill this well. Maximum anticipated surface pressure for the 16 3/4" 2M BOPE is 1365 psi, maximum anticipated surface pressure for 13 5/8" 5M BOPE is 1670 psi. The 16 3/4" BOPE will be tested 250 psi (Low) for 5 minutes and 2000 psi (High) for 10 minutes. The 13 5/8" BOPE will be tested 250 psi (Low) for 5 minutes and 5000 psi (High) for 10 minutes. Pressure test 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
16 3/4" 2M BOPE	6,400' TVD	2,752	1,344
13 5/8" 5M BOPE	7,256' TVD	3,120	1,523

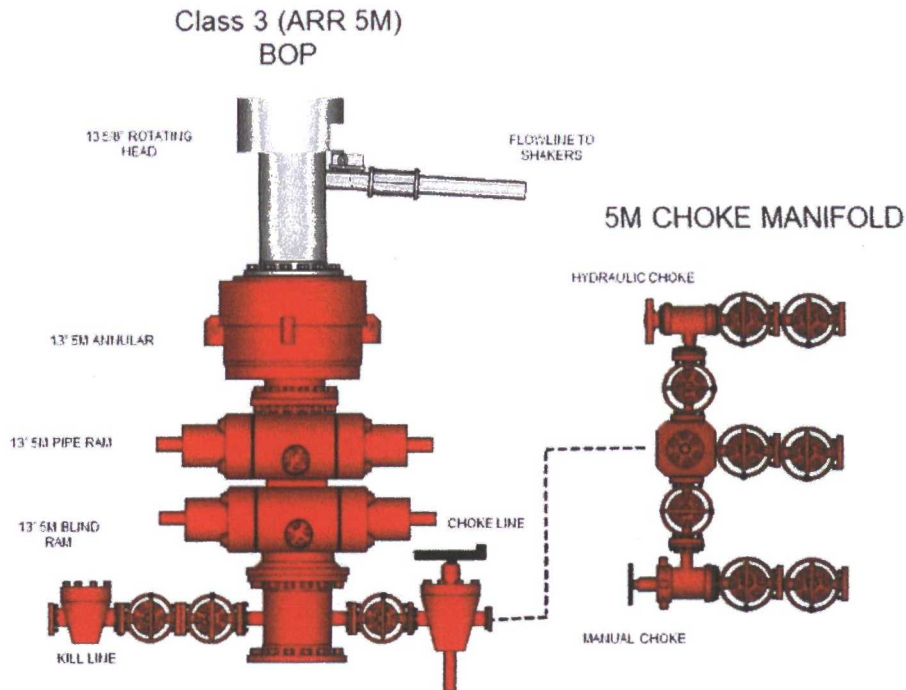
*Highest Bottom Hole Pressure encountered at 7,256' tvd. Total depth had less BHP.

*Gradient used to calculate BHP 0.43 psi/ft

16-3/4" BOPE



13-5/8" BOPE



SECTION – 3 Casing

Bit Program

20" Surface Hole = Surface to 300'
 14 3/4" = 300' to 3,300' / 4,400' MD = *11 3/4" (TO ACCOMMODATE CONTINGENCY STRING IF REQUIRED)
 10 5/8" = 4,400' to 6,400' MD = 8 5/8" casing point. (Above KOP)
 7-7/8" Curve and Lateral = 6,400' MD to 12,169' MD

Casing Program – all casing strings are new casing

Casing & Hole Size	Weight	Grade	Coupling	Setting Depth (MD)	Comments
16" (20")	65 ppf	J-55	BT&C	0' - 300'	New casing. Cement to surface. *Surface Casing maybe preset
*11-3/4" (14-3/4")	*47 ppf	*J-55	*BT&C	*0' – 3,300' / 4,400'	*New Casing. Two Stage Cement *Contingency String
8-5/8" (10-5/8")	32 ppf	N-80	LT&C	0' – 6,400' MD	New Casing. Two Stage Cement to surface
5-1/2" (7-7/8")	20 ppf	P-110	DQX TMK or equivalent	0' – 12,169' MD	New Casing – Single Stage Cement to overlap previous casing shoe.

Design Factor Table

Casing & Hole Size	Burst	Collapse	Axial	Tri-axial
16" (20") 65 ppf, J55, BTC	10.61	4.88	3.45	5.25
*11-3/4" (14-3/4") 47 ppf, J55, BTC	2.48	1.03	1.85	1.84
8-5/8" (10-5/8") 32 ppf, N80, LTC	1.35	1.05	2.18	1.71
5-1/2" (7-7/8") 20 ppf, P110, DQX TMK	1.10	2.92	2.16	1.39

Casing strings below the 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 -	1.0
Burst -	1.1
Jt. Strength -	1.40

*Design factor for 11 3/4" casing string based on 4,400'. Contingency string will be set at 3,300' or 4,400' depending on casing availability.

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. (*contingency string will use the same centralizer placement)

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.

*BP respectfully request to have option to set an 11 3/4" contingency string if severe losses occur while drilling fruitland coal interval. The casing string will cover the fruitland coal interval and shoe will be set between 3,300' and 4,400'. A two stage cement job will be utilized with stage tool at +/- 2700' MD. The following 8 5/8" casing string will have a two stage cement job with stage too at +/- 4,600' MD.

NOTE: If contingency string is not required the 8 5/8" casing will be ran to setting depth and a two stage cement job will be utilized with stage tool at +/- 2700' MD.

NOTE: DV tool placement is described in cement section and will be used at the discretion of the operator if there is evidence of heavy losses and we are concerned that cement will not make it to surface.

*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 surface casing in the event cement

fall back occurs.

- The 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.

Surface Casing Single Stage Job – (0-300'MD/TVD): 20" hole x 16" casing – 100% XS

Cement will be circulated to surface with 405 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 471 ft³

Intermediate Casing – Two Stage (0-6,400'MD/6,398'TVD): 14.75" (300' to 4,400') hole x 10.625" (4400' to 6400') hole x 8.625" casing Stage tool @ +/- 2,700' MD

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 5079 ft³

CONTINGENCY – 11.75" string will be run if we see excessive losses.

Intermediate 1 Casing – Two Stage (0-4,400'MD/4,399'TVD) 14.75" hole X 11.75" casing Stage tool @ +/- 2,700'MD: Contingency String

Cement will be circulated to surface. Stage 1 Lead – 235 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 – 450 sx 13.5 ppg, 1.317 ft³/sk, 94 lbm/sk, 0.10% Halad, 0.150 lbm/sk Poly E Flake, 4.96 Gal/sk freshwater. Stage 2 Lead – 670 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 - 150 sx 15.8 ppg, 1.147 ft³/sk, 94 lbm/sk, 4.99 Gal/sk. Volume 2553 ft³

Intermediate 2 Casing – Two Stage (0-6,400'MD/6,398'TVD) 10.625" hole x 8.625" casing Stage tool @ +/- 4,600'MD:

Cement will overlap previous casing shoe at 4,000' MD. Stage 1 Lead – 130 sx of Poz 12.3 ppg, 1.959 ft³/sk, 61.10 lbm/sk, 0.10% HR-5, 0.1250 lbm/sk Poly E Flake, 10.42 Gal/sk fresh water. Tail – 220 sx 13.5 ppg, 1.317 ft³/sk, 47 lbm/sk, 0.10% HR-5, 0.1250 lbm/sk Poly E Flake, 5.95 Gal/sk freshwater. Stage 2 - Lead – 145 sx of Poz 12.3 ppg, 1.959 ft³/sk, 61.10 lbm/sk, 0.10% HR-5, 0.1250 lbm/sk Poly E Flake, 10.42 Gal/sk fresh water. Tail - 70 sx 15.8 ppg, 1.147 ft³/sk, 94 lbm/sk, 0.10 Halad(R) - 9, 4.98 Gal/sk. Volume 888 ft³

Production Casing – Single Stage Conventional Cement (0' - 12,169' MD/ 7,246' TVD) 7.825" hole x 5.5" casing:

Cement will overlap previous 8.625" casing shoe. 825 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. Estimated top of cement at 5,500' MD. Volume 969 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'-300'	Surface	20"	FW/Gel	8.4-9.0	NC	8	12	9.0	Spud Mud
300'-6,400'	Intermediate	14 3/4" x 10 5/8"	LSND	8.6-9.0	<8	4-6	12-15	10.0	Fresh Water
6,400'-12,169'	Production	7-7/8"	WBM	9.0-12.0	<8	14-20	8-14	11.0	WBM

Contingency

Interval (MD)	Hole Section	Hole Size	Type	MW	FL	PV	YP	PH	REMARKS
300'-4,400'	Intermediate 1	14 3/4 "	LSND	8.6-9.0	<8	4-6	12-15	10.0	Fresh Water
4,400'-6,400'	Intermediate 2	10-5/8"	AIR	NC	NC	NC	NC	NC	

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

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

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

Open Hole Quad Combo + Image Log – TD of lateral to end of curve

Mud Logging:

Geologist & a manned mud-logging unit will be operational @ +/- 3,000' on the ~~800~~ Hole to TD and of the horizontal hole.

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 @ 7256' TVD: 3,120 psi

Maximum expected BHT @ 7256' TVD: ~160° F

Possible lost circulation in the Fruitland Coal to Mesa Verde (3,036' to 5,501'). 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.

Completion:

- **Pressure test**
 - Pressure test production casing to allowable frac pressure or as per BLM requirements
- **Stimulation**
 - well will be stimulated with approximately 17,000,000 pound of proppant in 350,000 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 June, 2017

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.

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

	Collapse	Burst	Tension
Min Safety Factors	1.125	1.000	1.400

	Size	Weight	Grade	Conn	Collapse	Burst	Tension (Pipe Body)	Tension (Connection)
Surface	16	65	J55	STC	630	1,640	736,000	439,000

80% of Burst = 1,312

24 ppf J55 STC

	Casing Depth	MW in	MW out	Pres in	Pres out	SF	
Collapse	300	0	15.80	0	246	2.56	Full evacuation with 15.8ppg c
Burst	300	8.3	0	1500	0	1.09	1500psi casing test
		Mud Wt	Air Wt	Bouy Wt	BW +100k		
Tension (Pipe Body)	300	8.3	19,500	17,029	117,029	6.29	100k over pull
Tension (Connection)	300	8.3	19,500	17,029	117,029	3.75	
	BF= 1- (MW)/65.5 =		0.8733				

New Open Save Wellbore Options ? Hide

API Recommended Properties of Casing

API Recommended Properties of Casing

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

	Collapse	Burst	Tension
Min Safety Factors	1.125	1.000	1.400

	Btm Interval	Size	Weight	Grade	Conn	Collapse	Burst	Tension (Pipe Body)	Tension (Connection)
Intermediate	2500	11.75	47	J55	BTC	1,510	3,070	737,000	807,000

80% of Burst =

2,456

47 ppf J55 BTC

	Measured Depth	TVD	MW in	MW out	Pres in	Pres out	SF	
Collapse	2500	2500	0	9.00	0	1170	1.29	
Burst	2500	2500	9.0	0	1170	0	2.62	
			Mud Wt	Air Wt	Bouy Wt	BW +100k		
Tension (Pipe Body)	2500	2500	9.0	117,500	101,355	201,355	3.66	100k over pull
Tension (Connection)		2500	9.0	117,500	101,355	201,355	4.01	
		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	1.000	1.400

	Btm Interval	Size	Weight	Grade	Conn	Collapse	Burst	Tension (Pipe Body)	Tension (Connection)
Intermediate	3900	11.75	54	K55	BTC	2,070	3,570	850,000	1,079,000

54 ppf K55 BTC

80% of Burst = 2,856

	Measured Depth	TVD	MW in	MW out	Pres in	Pres out	SF
Collapse	3900	3900	0	9.00	0	1825	1.13

Burst	3900	3900	9.0	0	1825	0	1.96
-------	------	------	-----	---	------	---	------

			Mud Wt	Air Wt	Bouy Wt	BW +100k	
Tension (Pipe Body)	3900	3900	9.0	210,600	181,663	281,663	3.02
Tension (Connection)		3900	9.0	210,600	181,663	281,663	3.83
		BF= 1- (MW)/65.5 =		0.8626			

100k over pull

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

	Collapse	Burst	Tension
Min Safety Factors	1.125	1.000	1.400

	Btm Interval	Size	Weight	Grade	Conn	Collapse	Burst	Tension (Pipe Body)	Tension (Connection)
Intermediate	6500	8.625	32	N80HC	BTC	3,800	5,710	732,000	737,000
						80% of Burst = 4,568			

32 ppf N80HC BTC

	Measured Depth	TVD	MW in	MW out	Pres in	Pres out	SF	
Collapse	6500	6498	0	9.00	0	3041	1.25	
Burst	6500	6498	9.0	0	3041	0	1.88	
Tension (Pipe Body)	6500	6498	Mud Wt	Air Wt	Bouy Wt	BW +100k	2.62	100k over pull
Tension (Connection)		6498	9.0	207,936	179,365	279,365	2.64	
			BF= 1- (MW)/65.5 = 0.8626					



Liner Casing Design - Evacuation/Max Mud Wt (collapse), Max Frac Pres (burst) 100k overpull (tensi

	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	P-110	BTC	11,110	12,640	729,000	641,000

20 ppf P-110 BTC

	Casing Depth TVD	MW in	MW out	Pres in	Pres out	SF	Notes
Collapse	7246	0	12.00	0	4522	2.46	
Burst	7246	12.0	0	10000	0	1.26	Max Allowable Treating Pressure Pop off valve will be set below
		Mud Wt	Air Wt	Bouy Wt	BW +100k		
Tension (Pipe Body)	7246	9.0	144,920	125,007	225,007	3.24	100k over pull
Tension (Connection)	7246	9.0	144,920	125,007	225,007	2.85	
	BF= 1- (MW)/65.5 =		0.8626				



Company: B.P.
Project: San Juan County, NM NAD83
Site: NEBU 602 Pad
Well: NEBU 602 #2H
Wellbore: OH
Design: Plan #2

PROJECT DETAILS: San Juan County, NAD83

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



Azimuths to Grid North
True North: -0.15°
Magnetic North: 8.98°

Magnetic Field
Strength: 50158.0anT
Dip Angle: 63.37°
Date: 6/8/2016
Model: HOGM

WELL DETAILS: NEBU 602 #2H

GL 6521' & RKB 15' @ 6536.00usft

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	
0.00	0.00	2154173.10	2812114.51	36.9195150	-107.5287902	602 #2H

Plan: Plan #2 (NEBU 602 #2H/OH)

Created By: Janie Collins Date: 16:11, June 13 2016

DESIGN TARGET DETAILS

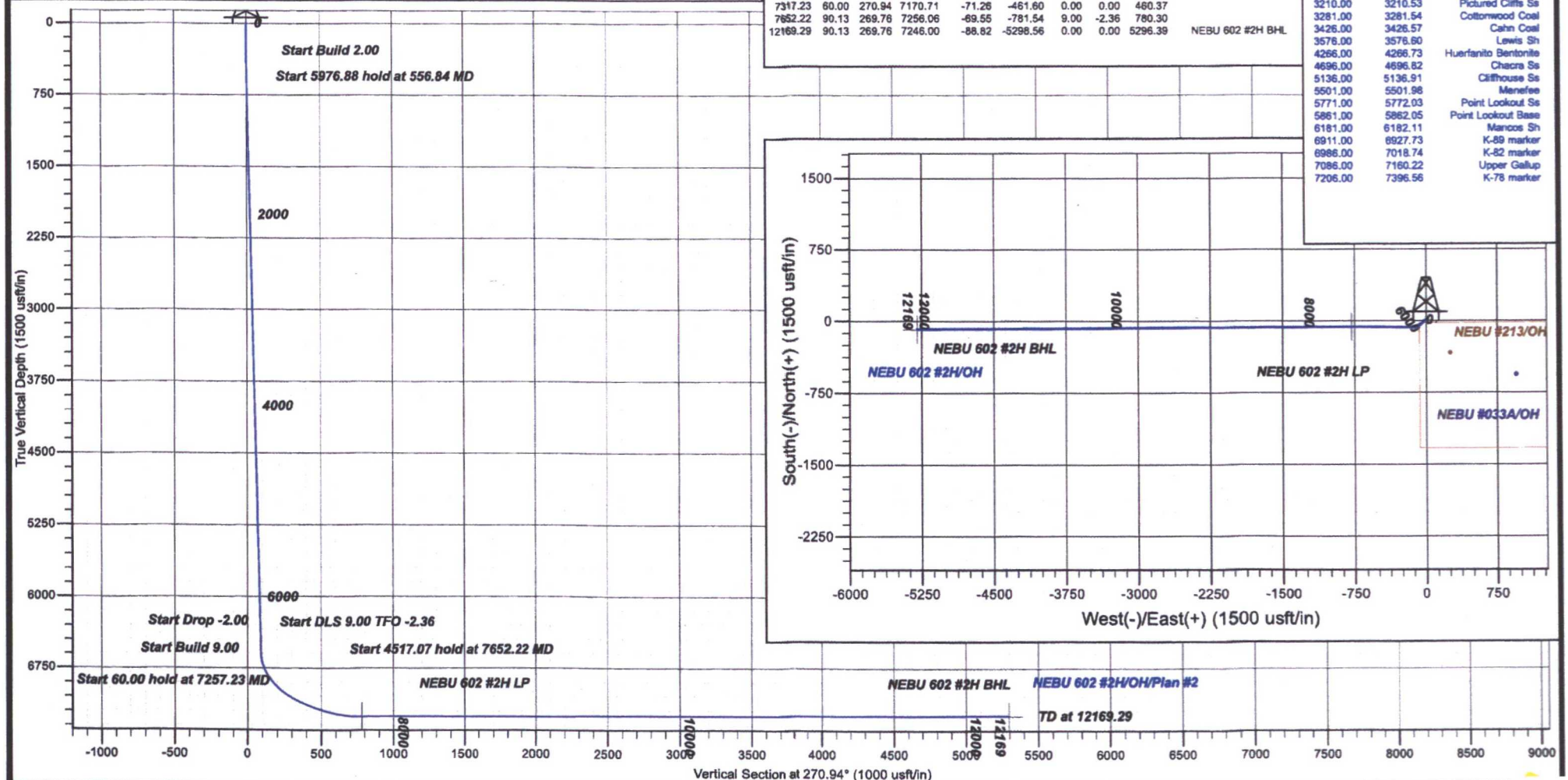
Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
NEBU 602 #2H BHL	7246.00	-88.82	-5298.56	2154084.28	2806815.95	36.9193161	-107.5469170
NEBU 602 #2H LP	7256.00	-69.55	-781.54	2154103.55	2811332.97	36.9193308	-107.5314645

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	
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	
556.84	1.14	229.76	556.84	-0.36	-0.43	2.00	229.76	0.42	
6533.72	1.14	229.76	6532.54	-76.97	-90.95	0.00	0.00	89.67	
6590.56	0.00	0.00	6589.38	-77.33	-91.38	2.00	180.00	90.10	
7257.23	80.00	270.94	7140.71	-72.11	-409.65	9.00	270.94	408.41	
7317.23	80.00	270.94	7170.71	-71.26	-461.60	0.00	0.00	460.37	
7652.22	90.13	269.76	7256.06	-69.55	-781.54	9.00	-2.36	780.30	
12169.29	90.13	269.76	7246.00	-88.82	-5298.56	0.00	0.00	5296.39	NEBU 602 #2H BHL

FORMATION TOP DETAILS

TVDPath	MDPath	Formation
15.00	15.00	San Jose Ss
2391.00	2391.36	Ojo Alamo Ss
2496.00	2496.39	Kirland
2981.00	2981.48	Fruitland
3036.00	3036.49	Fruitland Coal
3186.00	3186.52	Ignacio Coal
3210.00	3210.53	Pictured Cliffs Ss
3281.00	3281.54	Cottonwood Coal
3426.00	3426.57	Cahn Coal
3578.00	3578.60	Lewis Sh
4266.00	4266.73	Huerfano Bentonite
4696.00	4696.82	Chaco Ss
5136.00	5136.91	Citrus Ss
5501.00	5501.98	Mesa Verde
5771.00	5772.03	Point Lookout Ss
5861.00	5862.05	Point Lookout Base
6181.00	6182.11	Mancos Sh
6911.00	6927.73	K-89 marker
6986.00	7018.74	K-82 marker
7086.00	7160.22	Upper Gallup
7206.00	7396.56	K-78 marker





B.P.

San Juan County, NM NAD83

NEBU 602 Pad

NEBU 602 #2H - Slot 602 #2H

OH

Plan: Plan #2

Standard Planning Report

13 June, 2016



www.scientificdrilling.com



Planning Report



Database:	Grand Junction District	Local Co-ordinate Reference:	Well NEBU 602 #2H - Slot 602 #2H
Company:	B.P.	TVD Reference:	GL 6521' & RKB 15' @ 6536.00usft
Project:	San Juan County, NM NAD83	MD Reference:	GL 6521' & RKB 15' @ 6536.00usft
Site:	NEBU 602 Pad	North Reference:	Grid
Well:	NEBU 602 #2H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
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 602 Pad			
Site Position:		Northing:	2,154,140.58 usft	Latitude: 36.9194248
From: Map		Easting:	2,812,207.47 usft	Longitude: -107.5284725
Position Uncertainty:	0.00 usft	Slot Radius:	13.20 in	Grid Convergence: 0.18 °

Well	NEBU 602 #2H - Slot 602 #2H			
Well Position	+N/-S	32.52 usft	Northing:	2,154,173.10 usft
	+E/-W	-92.96 usft	Easting:	2,812,114.51 usft
Position Uncertainty	0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level: 6,521.00 usft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	6/8/2016	9.17	63.57	50,158

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	270.94

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	
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00	
556.84	1.14	229.76	556.84	-0.36	-0.43	2.00	2.00	0.00	229.76	
6,533.72	1.14	229.76	6,532.54	-76.97	-90.95	0.00	0.00	0.00	0.00	
6,590.56	0.00	0.00	6,589.38	-77.33	-91.38	2.00	-2.00	0.00	180.00	
7,257.23	60.00	270.94	7,140.71	-72.11	-409.65	9.00	9.00	0.00	270.94	
7,317.23	60.00	270.94	7,170.71	-71.26	-461.60	0.00	0.00	0.00	0.00	
7,652.22	90.13	269.76	7,256.06	-69.55	-781.54	9.00	8.99	-0.35	-2.36	
12,169.29	90.13	269.76	7,246.00	-88.82	-5,298.56	0.00	0.00	0.00	0.00	NEBU 602 #2H BHL



Planning Report



Database: Grand Junction District
Company: B.P.
Project: San Juan County, NM NAD83
Site: NEBU 602 Pad
Well: NEBU 602 #2H
Wellbore: OH
Design: Plan #2

Local Co-ordinate Reference:
TVD Reference:
MD Reference:
North Reference:
Survey Calculation Method:

Well NEBU 602 #2H - Slot 602 #2H
 GL 6521' & RKB 15' @ 6536.00usft
 GL 6521' & RKB 15' @ 6536.00usft
 Grid
 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
15.00	0.00	0.00	15.00	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
556.84	1.14	229.76	556.84	-0.36	-0.43	0.42	2.00	2.00	0.00
600.00	1.14	229.76	599.99	-0.92	-1.08	1.07	0.00	0.00	0.00
700.00	1.14	229.76	699.97	-2.20	-2.60	2.56	0.00	0.00	0.00
800.00	1.14	229.76	799.95	-3.48	-4.11	4.06	0.00	0.00	0.00
900.00	1.14	229.76	899.93	-4.76	-5.63	5.55	0.00	0.00	0.00
1,000.00	1.14	229.76	999.91	-6.04	-7.14	7.04	0.00	0.00	0.00
1,100.00	1.14	229.76	1,099.89	-7.33	-8.66	8.54	0.00	0.00	0.00
1,200.00	1.14	229.76	1,199.87	-8.61	-10.17	10.03	0.00	0.00	0.00
1,300.00	1.14	229.76	1,299.85	-9.89	-11.69	11.52	0.00	0.00	0.00
1,400.00	1.14	229.76	1,399.83	-11.17	-13.20	13.01	0.00	0.00	0.00
1,500.00	1.14	229.76	1,499.81	-12.45	-14.71	14.51	0.00	0.00	0.00
1,600.00	1.14	229.76	1,599.79	-13.73	-16.23	16.00	0.00	0.00	0.00
1,700.00	1.14	229.76	1,699.77	-15.02	-17.74	17.49	0.00	0.00	0.00
1,800.00	1.14	229.76	1,799.75	-16.30	-19.26	18.99	0.00	0.00	0.00
1,900.00	1.14	229.76	1,899.73	-17.58	-20.77	20.48	0.00	0.00	0.00
2,000.00	1.14	229.76	1,999.71	-18.86	-22.29	21.97	0.00	0.00	0.00
2,100.00	1.14	229.76	2,099.69	-20.14	-23.80	23.47	0.00	0.00	0.00
2,200.00	1.14	229.76	2,199.67	-21.42	-25.32	24.96	0.00	0.00	0.00
2,300.00	1.14	229.76	2,299.65	-22.71	-26.83	26.45	0.00	0.00	0.00
2,391.36	1.14	229.76	2,391.00	-23.88	-28.21	27.82	0.00	0.00	0.00
Ojo Alamo Ss									
2,400.00	1.14	229.76	2,399.63	-23.99	-28.34	27.95	0.00	0.00	0.00
2,496.39	1.14	229.76	2,496.00	-25.22	-29.80	29.39	0.00	0.00	0.00
Kirtland									
2,500.00	1.14	229.76	2,499.61	-25.27	-29.86	29.44	0.00	0.00	0.00
2,600.00	1.14	229.76	2,599.59	-26.55	-31.37	30.93	0.00	0.00	0.00
2,700.00	1.14	229.76	2,699.57	-27.83	-32.89	32.43	0.00	0.00	0.00
2,800.00	1.14	229.76	2,799.55	-29.11	-34.40	33.92	0.00	0.00	0.00
2,900.00	1.14	229.76	2,899.54	-30.39	-35.92	35.41	0.00	0.00	0.00
2,981.48	1.14	229.76	2,981.00	-31.44	-37.15	36.63	0.00	0.00	0.00
Fruitland									
3,000.00	1.14	229.76	2,999.52	-31.68	-37.43	36.91	0.00	0.00	0.00
3,036.49	1.14	229.76	3,036.00	-32.14	-37.98	37.45	0.00	0.00	0.00
Fruitland Coal									
3,100.00	1.14	229.76	3,099.50	-32.96	-38.95	38.40	0.00	0.00	0.00
3,186.52	1.14	229.76	3,186.00	-34.07	-40.26	39.69	0.00	0.00	0.00
Ignacio Coal									
3,200.00	1.14	229.76	3,199.48	-34.24	-40.46	39.89	0.00	0.00	0.00
3,210.53	1.14	229.76	3,210.00	-34.37	-40.62	40.05	0.00	0.00	0.00
Pictured Cliffs Ss									
3,281.54	1.14	229.76	3,281.00	-35.28	-41.70	41.11	0.00	0.00	0.00
Cottonwood Coal									
3,300.00	1.14	229.76	3,299.46	-35.52	-41.98	41.39	0.00	0.00	0.00
3,400.00	1.14	229.76	3,399.44	-36.80	-43.49	42.88	0.00	0.00	0.00
3,426.57	1.14	229.76	3,426.00	-37.14	-43.89	43.28	0.00	0.00	0.00



Database: Grand Junction District
Company: B.P.
Project: San Juan County, NM NAD83
Site: NEBU 602 Pad
Well: NEBU 602 #2H
Wellbore: OH
Design: Plan #2

Local Co-ordinate Reference: Well NEBU 602 #2H - Slot 602 #2H
TVD Reference: GL 6521' & RKB 15' @ 6536.00usft
MD Reference: GL 6521' & RKB 15' @ 6536.00usft
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)
Cahn Coal									
3,500.00	1.14	229.76	3,499.42	-38.08	-45.00	44.37	0.00	0.00	0.00
3,576.60	1.14	229.76	3,576.00	-39.07	-46.16	45.52	0.00	0.00	0.00
Lewis Sh									
3,600.00	1.14	229.76	3,599.40	-39.37	-46.52	45.87	0.00	0.00	0.00
3,700.00	1.14	229.76	3,699.38	-40.65	-48.03	47.36	0.00	0.00	0.00
3,800.00	1.14	229.76	3,799.36	-41.93	-49.55	48.85	0.00	0.00	0.00
3,900.00	1.14	229.76	3,899.34	-43.21	-51.06	50.35	0.00	0.00	0.00
4,000.00	1.14	229.76	3,999.32	-44.49	-52.58	51.84	0.00	0.00	0.00
4,100.00	1.14	229.76	4,099.30	-45.77	-54.09	53.33	0.00	0.00	0.00
4,200.00	1.14	229.76	4,199.28	-47.06	-55.61	54.83	0.00	0.00	0.00
4,266.73	1.14	229.76	4,266.00	-47.91	-56.62	55.82	0.00	0.00	0.00
Huerfano Bentonite									
4,300.00	1.14	229.76	4,299.26	-48.34	-57.12	56.32	0.00	0.00	0.00
4,400.00	1.14	229.76	4,399.24	-49.62	-58.63	57.81	0.00	0.00	0.00
4,500.00	1.14	229.76	4,499.22	-50.90	-60.15	59.31	0.00	0.00	0.00
4,600.00	1.14	229.76	4,599.20	-52.18	-61.66	60.80	0.00	0.00	0.00
4,696.82	1.14	229.76	4,696.00	-53.42	-63.13	62.24	0.00	0.00	0.00
Chacra Ss									
4,700.00	1.14	229.76	4,699.18	-53.46	-63.18	62.29	0.00	0.00	0.00
4,800.00	1.14	229.76	4,799.16	-54.75	-64.69	63.79	0.00	0.00	0.00
4,900.00	1.14	229.76	4,899.14	-56.03	-66.21	65.28	0.00	0.00	0.00
5,000.00	1.14	229.76	4,999.12	-57.31	-67.72	66.77	0.00	0.00	0.00
5,100.00	1.14	229.76	5,099.10	-58.59	-69.24	68.27	0.00	0.00	0.00
5,136.91	1.14	229.76	5,136.00	-59.06	-69.79	68.82	0.00	0.00	0.00
Cliffhouse Ss									
5,200.00	1.14	229.76	5,199.08	-59.87	-70.75	69.76	0.00	0.00	0.00
5,300.00	1.14	229.76	5,299.06	-61.15	-72.26	71.25	0.00	0.00	0.00
5,400.00	1.14	229.76	5,399.04	-62.44	-73.78	72.75	0.00	0.00	0.00
5,500.00	1.14	229.76	5,499.02	-63.72	-75.29	74.24	0.00	0.00	0.00
5,501.98	1.14	229.76	5,501.00	-63.74	-75.32	74.27	0.00	0.00	0.00
Menefee									
5,600.00	1.14	229.76	5,599.00	-65.00	-76.81	75.73	0.00	0.00	0.00
5,700.00	1.14	229.76	5,698.98	-66.28	-78.32	77.23	0.00	0.00	0.00
5,772.03	1.14	229.76	5,771.00	-67.20	-79.41	78.30	0.00	0.00	0.00
Point Lookout Ss									
5,800.00	1.14	229.76	5,798.96	-67.56	-79.84	78.72	0.00	0.00	0.00
5,862.05	1.14	229.76	5,861.00	-68.36	-80.78	79.64	0.00	0.00	0.00
Point Lookout Base									
5,900.00	1.14	229.76	5,898.94	-68.84	-81.35	80.21	0.00	0.00	0.00
6,000.00	1.14	229.76	5,998.93	-70.13	-82.87	81.70	0.00	0.00	0.00
6,100.00	1.14	229.76	6,098.91	-71.41	-84.38	83.20	0.00	0.00	0.00
6,182.11	1.14	229.76	6,181.00	-72.46	-85.62	84.42	0.00	0.00	0.00
Mancos Sh									
6,200.00	1.14	229.76	6,198.89	-72.69	-85.90	84.69	0.00	0.00	0.00
6,300.00	1.14	229.76	6,298.87	-73.97	-87.41	86.18	0.00	0.00	0.00
6,400.00	1.14	229.76	6,398.85	-75.25	-88.92	87.68	0.00	0.00	0.00
6,500.00	1.14	229.76	6,498.83	-76.53	-90.44	89.17	0.00	0.00	0.00
6,533.72	1.14	229.76	6,532.54	-76.97	-90.95	89.67	0.00	0.00	0.00
6,590.56	0.00	0.00	6,589.38	-77.33	-91.38	90.10	2.00	-2.00	0.00
6,600.00	0.85	270.94	6,598.82	-77.33	-91.45	90.17	9.00	9.00	0.00
6,700.00	9.85	270.94	6,698.28	-77.18	-100.76	99.48	9.00	9.00	0.00
6,800.00	18.85	270.94	6,795.06	-76.77	-125.52	124.24	9.00	9.00	0.00



Database:	Grand Junction District	Local Co-ordinate Reference:	Well NEBU 602 #2H - Slot 602 #2H
Company:	B.P.	TVD Reference:	GL 6521' & RKB 15' @ 6536.00usft
Project:	San Juan County, NM NAD83	MD Reference:	GL 6521' & RKB 15' @ 6536.00usft
Site:	NEBU 602 Pad	North Reference:	Grid
Well:	NEBU 602 #2H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
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)
6,900.00	27.85	270.94	6,886.78	-76.12	-165.10	163.83	9.00	9.00	0.00
6,927.73	30.34	270.94	6,911.00	-75.90	-178.58	177.31	9.00	9.00	0.00
K-89 marker									
7,000.00	36.85	270.94	6,971.17	-75.24	-218.55	217.29	9.00	9.00	0.00
7,018.74	38.54	270.94	6,986.00	-75.06	-230.01	228.75	9.00	9.00	0.00
K-82 marker									
7,100.00	45.85	270.94	7,046.16	-74.16	-284.54	283.28	9.00	9.00	0.00
7,160.22	51.27	270.94	7,086.00	-73.42	-329.65	328.41	9.00	9.00	0.00
Upper Gallup									
7,200.00	54.85	270.94	7,109.91	-72.90	-361.44	360.20	9.00	9.00	0.00
7,257.23	60.00	270.94	7,140.71	-72.11	-409.65	408.41	9.00	9.00	0.00
7,300.00	60.00	270.94	7,162.09	-71.50	-446.68	445.45	0.00	0.00	0.00
7,317.23	60.00	270.94	7,170.71	-71.26	-461.60	460.37	0.00	0.00	0.00
7,396.56	67.13	270.62	7,206.00	-70.29	-532.59	531.36	9.00	8.99	-0.40
K-78 marker									
7,400.00	67.44	270.61	7,207.33	-70.26	-535.76	534.53	9.00	8.99	-0.38
7,500.00	76.44	270.25	7,238.30	-69.55	-630.73	629.51	9.00	8.99	-0.36
7,600.00	85.43	269.92	7,254.04	-69.40	-729.38	728.14	9.00	8.99	-0.33
7,652.21	90.13	269.76	7,256.06	-69.55	-781.54	780.29	9.00	8.99	-0.32
NEBU 602 #2H LP									
7,700.00	90.13	269.76	7,255.95	-69.75	-829.33	828.07	0.00	0.00	0.00
7,800.00	90.13	269.76	7,255.73	-70.18	-929.32	928.05	0.00	0.00	0.00
7,900.00	90.13	269.76	7,255.51	-70.61	-1,029.32	1,028.03	0.00	0.00	0.00
8,000.00	90.13	269.76	7,255.29	-71.03	-1,129.32	1,128.00	0.00	0.00	0.00
8,100.00	90.13	269.76	7,255.06	-71.46	-1,229.32	1,227.98	0.00	0.00	0.00
8,200.00	90.13	269.76	7,254.84	-71.89	-1,329.32	1,327.96	0.00	0.00	0.00
8,300.00	90.13	269.76	7,254.62	-72.31	-1,429.32	1,427.94	0.00	0.00	0.00
8,400.00	90.13	269.76	7,254.40	-72.74	-1,529.32	1,527.92	0.00	0.00	0.00
8,500.00	90.13	269.76	7,254.17	-73.17	-1,629.32	1,627.90	0.00	0.00	0.00
8,600.00	90.13	269.76	7,253.95	-73.59	-1,729.32	1,727.88	0.00	0.00	0.00
8,700.00	90.13	269.76	7,253.73	-74.02	-1,829.31	1,827.85	0.00	0.00	0.00
8,800.00	90.13	269.76	7,253.50	-74.45	-1,929.31	1,927.83	0.00	0.00	0.00
8,900.00	90.13	269.76	7,253.28	-74.87	-2,029.31	2,027.81	0.00	0.00	0.00
9,000.00	90.13	269.76	7,253.06	-75.30	-2,129.31	2,127.79	0.00	0.00	0.00
9,100.00	90.13	269.76	7,252.84	-75.73	-2,229.31	2,227.77	0.00	0.00	0.00
9,200.00	90.13	269.76	7,252.61	-76.15	-2,329.31	2,327.75	0.00	0.00	0.00
9,300.00	90.13	269.76	7,252.39	-76.58	-2,429.31	2,427.72	0.00	0.00	0.00
9,400.00	90.13	269.76	7,252.17	-77.01	-2,529.31	2,527.70	0.00	0.00	0.00
9,500.00	90.13	269.76	7,251.95	-77.43	-2,629.30	2,627.68	0.00	0.00	0.00
9,600.00	90.13	269.76	7,251.72	-77.86	-2,729.30	2,727.66	0.00	0.00	0.00
9,700.00	90.13	269.76	7,251.50	-78.29	-2,829.30	2,827.64	0.00	0.00	0.00
9,800.00	90.13	269.76	7,251.28	-78.71	-2,929.30	2,927.62	0.00	0.00	0.00
9,900.00	90.13	269.76	7,251.05	-79.14	-3,029.30	3,027.59	0.00	0.00	0.00
10,000.00	90.13	269.76	7,250.83	-79.57	-3,129.30	3,127.57	0.00	0.00	0.00
10,100.00	90.13	269.76	7,250.61	-79.99	-3,229.30	3,227.55	0.00	0.00	0.00
10,200.00	90.13	269.76	7,250.39	-80.42	-3,329.30	3,327.53	0.00	0.00	0.00
10,300.00	90.13	269.76	7,250.16	-80.85	-3,429.30	3,427.51	0.00	0.00	0.00
10,400.00	90.13	269.76	7,249.94	-81.27	-3,529.29	3,527.49	0.00	0.00	0.00
10,500.00	90.13	269.76	7,249.72	-81.70	-3,629.29	3,627.46	0.00	0.00	0.00
10,600.00	90.13	269.76	7,249.50	-82.13	-3,729.29	3,727.44	0.00	0.00	0.00
10,700.00	90.13	269.76	7,249.27	-82.55	-3,829.29	3,827.42	0.00	0.00	0.00
10,800.00	90.13	269.76	7,249.05	-82.98	-3,929.29	3,927.40	0.00	0.00	0.00
10,900.00	90.13	269.76	7,248.83	-83.41	-4,029.29	4,027.38	0.00	0.00	0.00



Planning Report



Database:	Grand Junction District	Local Co-ordinate Reference:	Well NEBU 602 #2H - Slot 602 #2H
Company:	B.P.	TVD Reference:	GL 6521' & RKB 15' @ 6536.00usft
Project:	San Juan County, NM NAD83	MD Reference:	GL 6521' & RKB 15' @ 6536.00usft
Site:	NEBU 602 Pad	North Reference:	Grid
Well:	NEBU 602 #2H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
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)
11,000.00	90.13	269.76	7,248.60	-83.83	-4,129.29	4,127.36	0.00	0.00	0.00
11,100.00	90.13	269.76	7,248.38	-84.26	-4,229.29	4,227.33	0.00	0.00	0.00
11,200.00	90.13	269.76	7,248.16	-84.69	-4,329.29	4,327.31	0.00	0.00	0.00
11,300.00	90.13	269.76	7,247.94	-85.11	-4,429.28	4,427.29	0.00	0.00	0.00
11,400.00	90.13	269.76	7,247.71	-85.54	-4,529.28	4,527.27	0.00	0.00	0.00
11,500.00	90.13	269.76	7,247.49	-85.96	-4,629.28	4,627.25	0.00	0.00	0.00
11,600.00	90.13	269.76	7,247.27	-86.39	-4,729.28	4,727.23	0.00	0.00	0.00
11,700.00	90.13	269.76	7,247.05	-86.82	-4,829.28	4,827.21	0.00	0.00	0.00
11,800.00	90.13	269.76	7,246.82	-87.24	-4,929.28	4,927.18	0.00	0.00	0.00
11,900.00	90.13	269.76	7,246.60	-87.67	-5,029.28	5,027.16	0.00	0.00	0.00
12,000.00	90.13	269.76	7,246.38	-88.10	-5,129.28	5,127.14	0.00	0.00	0.00
12,100.00	90.13	269.76	7,246.15	-88.52	-5,229.27	5,227.12	0.00	0.00	0.00
12,169.29	90.13	269.76	7,246.00	-88.82	-5,298.56	5,296.39	0.00	0.00	0.00
NEBU 602 #2H BHL									

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 602 #2H BHL - plan hits target center - Point	0.00	0.00	7,246.00	-88.82	-5,298.56	2,154,084.28	2,806,815.95	36.9193161	-107.5469170
NEBU 602 #2H LP - plan misses target center by 0.06usft at 7652.21usft MD (7256.06 TVD, -69.55 N, -781.54 E) - Point	0.00	0.00	7,256.00	-69.55	-781.54	2,154,103.55	2,811,332.97	36.9193307	-107.5314645



Database: Grand Junction District
Company: B.P.
Project: San Juan County, NM NAD83
Site: NEBU 602 Pad
Well: NEBU 602 #2H
Wellbore: OH
Design: Plan #2

Local Co-ordinate Reference:
TVD Reference:
MD Reference:
North Reference:
Survey Calculation Method:

Well NEBU 602 #2H - Slot 602 #2H
GL 6521' & RKB 15' @ 6536.00usft
GL 6521' & RKB 15' @ 6536.00usft
Grid
Minimum Curvature

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
15.00	15.00	San Jose Ss		0.00	0.00	
2,391.36	2,391.00	Ojo Alamo Ss		0.00	0.00	
2,496.39	2,496.00	Kirtland		0.00	0.00	
2,981.48	2,981.00	Fruitland		0.00	0.00	
3,036.49	3,036.00	Fruitland Coal		0.00	0.00	
3,186.52	3,186.00	Ignacio Coal		0.00	0.00	
3,210.53	3,210.00	Pictured Cliffs Ss		0.00	0.00	
3,281.54	3,281.00	Cottonwood Coal		0.00	0.00	
3,426.57	3,426.00	Cahn Coal		0.00	0.00	
3,576.60	3,576.00	Lewis Sh		0.00	0.00	
4,266.73	4,266.00	Huerfano Bentonite		0.00	0.00	
4,696.82	4,696.00	Chacra Ss		0.00	0.00	
5,136.91	5,136.00	Cliffhouse Ss		0.00	0.00	
5,501.98	5,501.00	Menefee		0.00	0.00	
5,772.03	5,771.00	Point Lookout Ss		0.00	0.00	
5,862.05	5,861.00	Point Lookout Base		0.00	0.00	
6,182.11	6,181.00	Mancos Sh		0.00	0.00	
6,927.73	6,911.00	K-89 marker		0.00	0.00	
7,018.74	6,986.00	K-82 marker		0.00	0.00	
7,160.22	7,086.00	Upper Gallup		0.00	0.00	
7,396.56	7,206.00	K-78 marker		0.00	0.00	