Form 3160-3
(August 1999)

FORM APPROVED
OMB No. 1004-0136
Expires November 30, 2000

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL OR REENTER

5. Lease Serial No.
SF - 078194

6. If Indian, Allottee or Tribe Name

1a. Type of Work: ☒ DRILL ☐ REENTER

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

1b. Type of Well: ☐ Oil Well ☒ Gas Well ☐ Other ☐ Single Zone ☒ Multiple Zone

8. Lease Name and Well No.
LUDWICK LS 20 M

2. Name of Operator
BP AMERICA PRODUCTION CO
Contact: CHERRY HLAVA
E-Mail: hlavacl@bp.com

9. API Well No.
30-045-32920

3a. Address
HOUSTON, TX 77253-3092

3b. Phone No. (include area code)
Ph: 281.366.4081

10. Field and Pool, or Exploratory
BASIN DK & BLANCO MV

4. Location of Well *(Report location clearly and in accordance with any State requirements.*)*

At surface SWNW Lot 5 1640FNL 1200FWL 36.78583 N Lat, 107.91250 W Lon

At proposed prod. zone SWNW Lot 5 1640FNL 1200FWL 36.78583 N Lat, 107.91250 W Lon

11. Sec., T., R., M., or Blk. and Survey or Area
E Sec 29 T30N R10W Mer NMP

14. Distance in miles and direction from nearest town or post office*
6.1 MILES EAST FROM AZTEC, NM

12. County or Parish
SAN JUAN

13. State
NM

15. Distance from proposed location to nearest property or lease line, ft. (Also to nearest drig. unit line, if any)
1200

16. No. of Acres in Lease
313.30

17. Spacing Unit dedicated to this well
313.3 W/2

18. Distance from proposed location to nearest well, drilling, completed, applied for, on this lease, ft.

19. Proposed Depth
7205 MD
7205 TVD

20. BLM/BIA Bond No. on file
WY2924

21. Elevations (Show whether DF, KB, RT, GL, etc.
6100 GL

22. Approximate date work will start
05/15/2005

23. Estimated duration
7

24. Attachments

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

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

25. Signature	Name (Printed/Typed)	Date
(Electronic Submission)	CHERRY HLAVA Ph: 281.366.4081	03/02/2005

Title
AGENT

Approved by (Signature)	Name (Printed/Typed)	Date
Acting Field Manager - Minerals		5/31/05

Title

Office

Application approval does not warrant or certify 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.

Additional Operator Remarks (see next page)

Electronic Submission #54674 verified by the BLM Well Information System
For BP AMERICA PRODUCTION CO, sent to the Farmington

**** OPERATOR-SUBMITTED ** OPERATOR-SUBMITTED ** OPERATOR-SUBMITTED ****

NMOCD

District I
PO Box 1980, Hobbs NM 88241-1980
District II
PO Drawer KK, Artesia, NM 87211-0719
District III
1000 Rio Brazos Rd., Aztec, NM 87410
District IV
PO Box 2088, Santa Fe, NM 87504-2088

State of New Mexico
Energy, Minerals & Natural Resources Department

OIL CONSERVATION DIVISION
PO Box 2088
Santa Fe, NM 87504-2088

Form C-102
Revised February 21, 1994
Instructions on back
Submit to Appropriate District Office
State Lease - 4 Copies
Fee Lease - 3 Copies

☐ AMENDED REPORT

RECEIVED
MAR 2005
OIL CONS. DIV.
DIST. 3

WELL LOCATION AND ACREAGE DEDICATION PLAT

¹ API Number	² Pool Code	³ Pool Name
30-045-32920	71599 & 72319	Basin Dakota & Blanco Mesaverde

⁴ Property Code	⁵ Property Name	⁶ Well Number
000811	Ludwick LS	# 20M

⁷ OGRID No.	⁸ Operator Name	⁹ Elevation
00778	BP AMERICA PRODUCTION COMPANY	6100

¹⁰ Surface Location

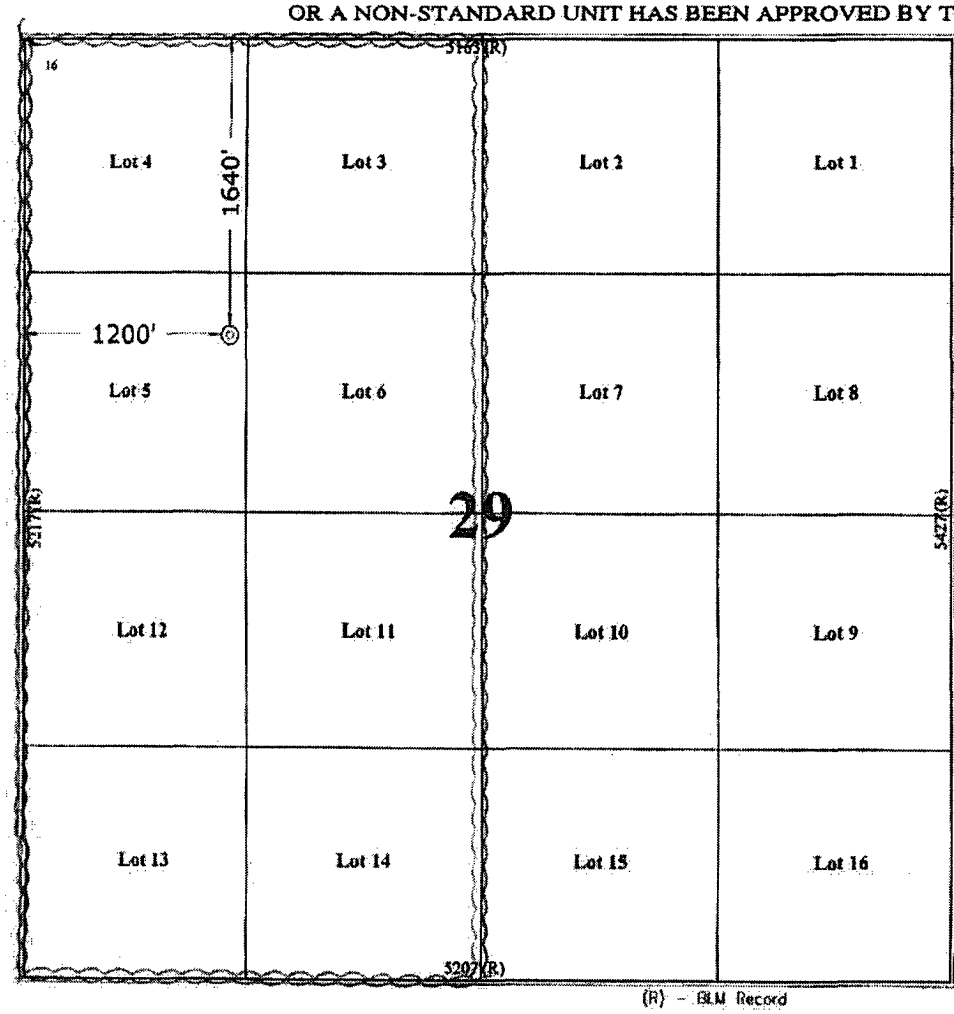
UL or Lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
E (Lot 5)	29	30 N	10 W		1640	NORTH	1200	WEST	SAN JUAN

¹¹ Bottom Hole Location If Different From Surface

⁷ UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County

¹² Dedicated Acres	¹³ Joint or Infill	¹⁴ Consolidation Code	¹⁵ Order No.
313.30			

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



(R) - BLM Record

¹⁷ OPERATOR CERTIFICATION

I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief.

Signature: Cherry Hlava

Printed Name: Cherry Hlava

Title: Regulatory Analyst

Date: 3-1-05

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.

March 4, 2004

Date of Survey

Signature and Seal of Professional Surveyor

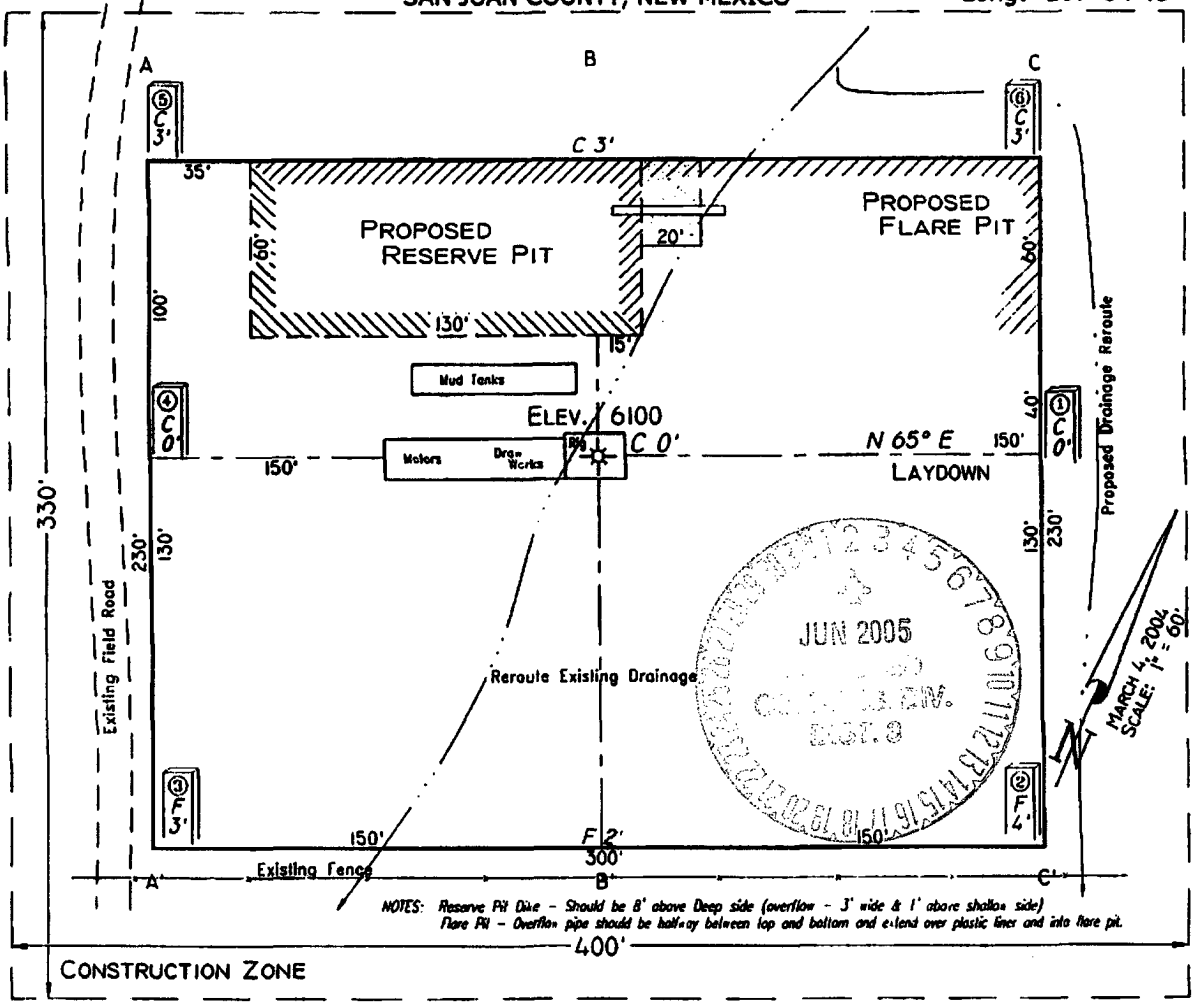
GARY D. VANN
NEW MEXICO
7016
REGISTERED PROFESSIONAL LAND SURVEYOR

7016

Certificate Number

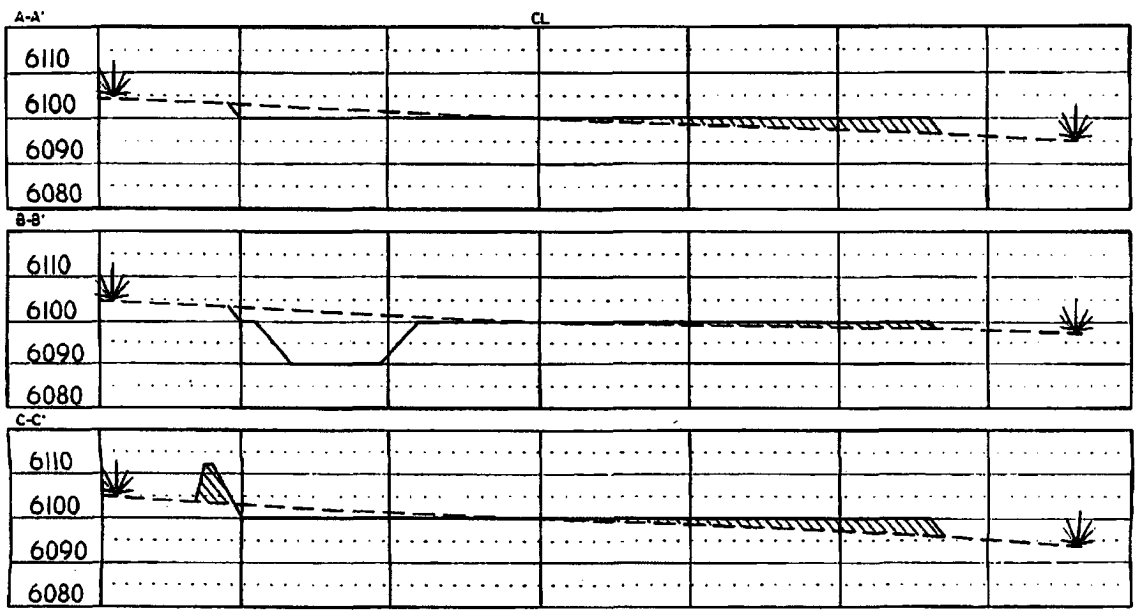
PAD LAYOUT PLAN & PROFILE
BP AMERICA PRODUCTION COMPANY
Ludwick LS # 20M
1640' F/NL 1200' F/WL
SEC. 29, T30N, R10W, N.M.P.M.
SAN JUAN COUNTY, NEW MEXICO

Lat: 36°47'09"
Long: 107°54'45"



Area of Construction Zone - 330'x400' or 3.03 acres, more or less.

SCALE: 1"=60'-HORIZ.
1"=40'-VERT.



NOTE: Contractor should call One-Call for location of any marked or unmarked buried pipelines or cables on well pad and/or access road at least two (2) working days prior to construction.

Cuts and fills shown are approximate - final finished elevation is to be adjusted so earthwork will balance. Corner stakes are approximate and do not include additional areas needed for sideslopes and drainages. Final Pad Dimensions are to be verified by Contractor.

VANN SURVEYS
P. O. Box 1306
Farmington, NM

Additional Operator Remarks
Ludwick LS 20M
APD

BP America Production Company respectfully requests permission to drill the subject well to a total depth of approximately 7205'. Complete in the Basin Dakota Pool, isolate the Dakota; complete into the Blanco Mesaverde, establish a production rate; drill out the bridge plug and commingle production downhole.

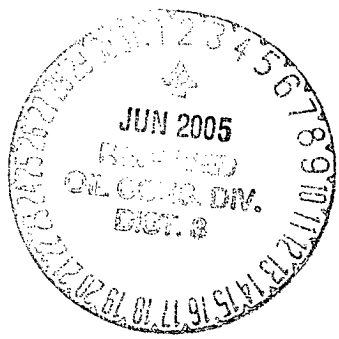
Application for Downhole Commingling authority (NMOCD order R-11363) will be submitted to all appropriate for approval after Permit to Drill has been approved.

If terrain allows it is our intent to pre-set the 9 5/8" casing on the above mentioned well by drilling a surface hole with air/air mist in lieu of drilling mud and the surface casing be cemented with 94.5 cu/ft type I-II, 20% FLYASH, 14.5 PPG, 7.41 gal/sk, 1.61 cf/sk Yield, 80 DEG BHST ready mix cement. If the area will not allow for pre-set the approved cement program will be followed.

SUPPLEMENTAL TO SURFACE USE PLAN

New Facilities:
A 4.5" diameter buried steel pipeline that is +/- 100 feet in length will be constructed. The pipe wall thickness is .156 and the pipe wall strength is 42,000#. It will be adjacent to the access road and tie the well into an existing gas meter operated by BP America Production Company. The pipeline will not be used to transport gas to drill the well. After the well is spud the pipeline will be authorized by a right-of-way issued by El Paso Field Services.

APD/ROW



BP AMERICA PRODUCTION COMPANY

DRILLING AND COMPLETION PROGRAM

2/25/2005

Lease:	Ludwick LS	**Well Name & No.**	Ludwick LS #20M	**Field:**	Basin Dakota/Blanco Mesaverde
County:	San Juan, New Mexico	**Surface Location:**	29-30N-10W: 1640' FNL, 1200' FWL		
Minerals:	Federal	**Surface:**	Lat: 36.7856615 deg; Long: -107.9118055 deg		
Rig :	Aztec 184	**BH Location:**	same		
OBJECTIVE:	Drill 240' below the top of the Two Wells Mbr, set 4-1/2" production casing, Stimulate DK, MF, and PL intervals.				

METHOD OF DRILLING

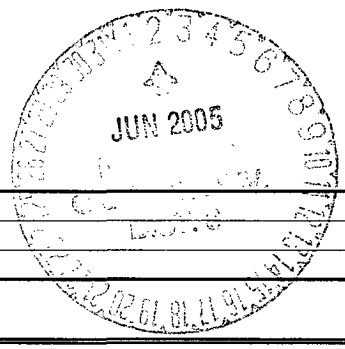
TYPE OF TOOLS	DEPTH OF DRILLING
Rotary	0 - TD

LOG PROGRAM

Type	Depth Interval
Single Run	
Cased Hole	
TDT- CBL	TD to 7" shoe
	Identify 4 ½" cement top

REMARKS:

- Please report any flares (magnitude & duration).



APPROXIMATE DEPTHS OF GEOLOGICAL MARKER

Actual GL: 6100 Estimated KB: 6,114.0'

Marker		SUBSEA	TVD	APPROX. MD
Ojo Alamo		4,890'	1,224'	1,224'
Kirtland		4,746'	1,368'	1,368'
Fruitland	*	4,104'	2,010'	2,010'
Fruitland Coal	*	3,746'	2,368'	2,368'
Pictured Cliffs	*	3,552'	2,562'	2,562'
Lewis	*	3,257'	2,857'	2,857'
Cliff House	#	2,104'	4,010'	4,010'
Menefee	#	1,729'	4,385'	4,385'
Point Lookout	#	1,250'	4,864'	4,864'
Mancos		841'	5,273'	5,273'
Greenhorn		-742'	6,856'	6,856'
Graneros (bent,mkr)		-797'	6,911'	6,911'
Two Wells	#	-851'	6,965'	6,965'
Paguate	#	-928'	7,042'	7,042'
Cubero	#	-986'	7,100'	7,100'
L. Cubero	#	-1,027'	7,141'	7,141'
Encinal Cyn	#	-1,057'	7,171'	7,171'
TOTAL DEPTH:		-1,091'	7,205'	7,205'

Probable completion interval * Possible Pay

SPECIAL TESTS

TYPE
None

REMARKS:

DRILL CUTTING SAMPLES			DRILLING TIME	
FREQUENCY	DEPTH		FREQUENCY	DEPTH
30'/10' intervals	2,957'	to TD	Geolograph	0 - TD

MUD PROGRAM:

Interval	Type□Mud	#/gal	Vis, □sec/qt	/30 min	Other Specification
200'	Spud	8.8 - 9.0	Sufficient to clean hole.		
2,957'	Water/LSND	8.4 - 9.0		<9	Sweep hole while whilst water drilling, LCM onsite
7,205'	Air	1	1000 cfm for hammer		Volume sufficient to maintain a stable and clean wellbore

CASING PROGRAM:

Casing□String	Depth	Size	Casing Size	Grade, Thread	Weight	Landing Point	Cement
Surface/Conductor	200'	13 1/2"	9-5/8"	H-40 ST&C	32#		cmt to surface
Intermediate 1	2,957'	8-3/4"	7"	J/K-55 ST&C	20#	100' below LWIS	cmt to surface
Production	7,205'	6-1/4"	4-1/2"	J-55	11.6#	DKOT	150' inside Intermediate - TOC survey required

CORING PROGRAM:

None

COMPLETION PROGRAM:

Rigless, 2-3 Stage Limited Entry Hydraulic Frac, FMC Unihead

GENERAL REMARKS:

Notify BLM/NMOCD 24 hours prior to Spud, BOP testing, and Casing and Cementing.

BOP Pressure Testing Requirements

Formation	Depth	Anticipated bottom hole pressure	Max anticipated surface pressure**
Cliffhouse	4,010'	500	0
Point Lookout	4,864'	600	0
Dakota	6,965'	2600	1067.7

Requested BOP Pressure Test Exception = 1500 psi

** Note: Determined using the following formula: ABHP – (.22*TVD) = ASP

Form 46 Reviewed by:	Logging program reviewed by:			
PREPARED BY:	**APPROVED:**	**DATE:**	**APPROVED:**	**DATE:**
HGJ JMP		25-Feb-05		
Form 46 7-84bw	For Drilling Dept.		For Production Dept.	

SAN JUAN BASIN
Dakota Formation
Pressure Control Equipment

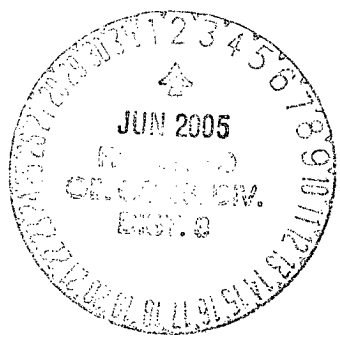
Background

The objective Dakota formation maximum surface pressure is anticipated to be less than 1000 psi, based on shut-in surface pressures from adjacent wells. Pressure control equipment working pressure minimum requirements are therefore 2000 psi. Equipment to be used will conform to API RP-53 (Figure 2.C.2) for a 2000 psi system per Federal Onshore Order No. 2. Due to available conventional equipment within the area, 3000 psi rated pressure control equipment will typically be utilized in a double ram type arrangement. Regional drilling rights to be utilized have substructure height limitations which exclude the use of annular preventers; therefore a rotating head will be installed above these rams. This pressure control equipment will be utilized for conventional drilling below conductor to total depth in the Basin Dakota. No abnormal temperature, pressure, or H2S anticipated.

Equipment Specification

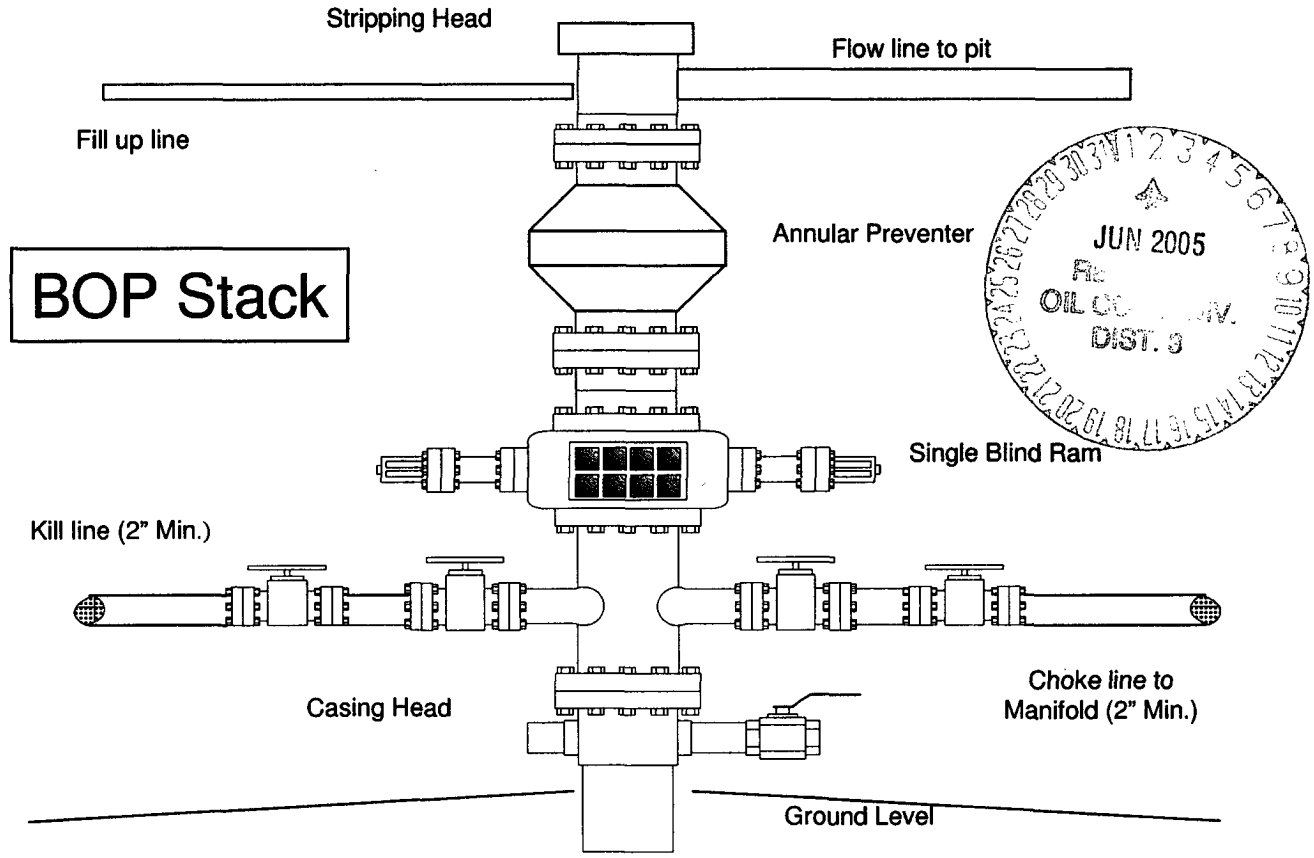
Interval	**BOP Equipment**
Below conductor casing to total depth	**11" nominal or 7 1/16",2000 psi single ram preventer with 3000 psi annular preventer and rotating head.**

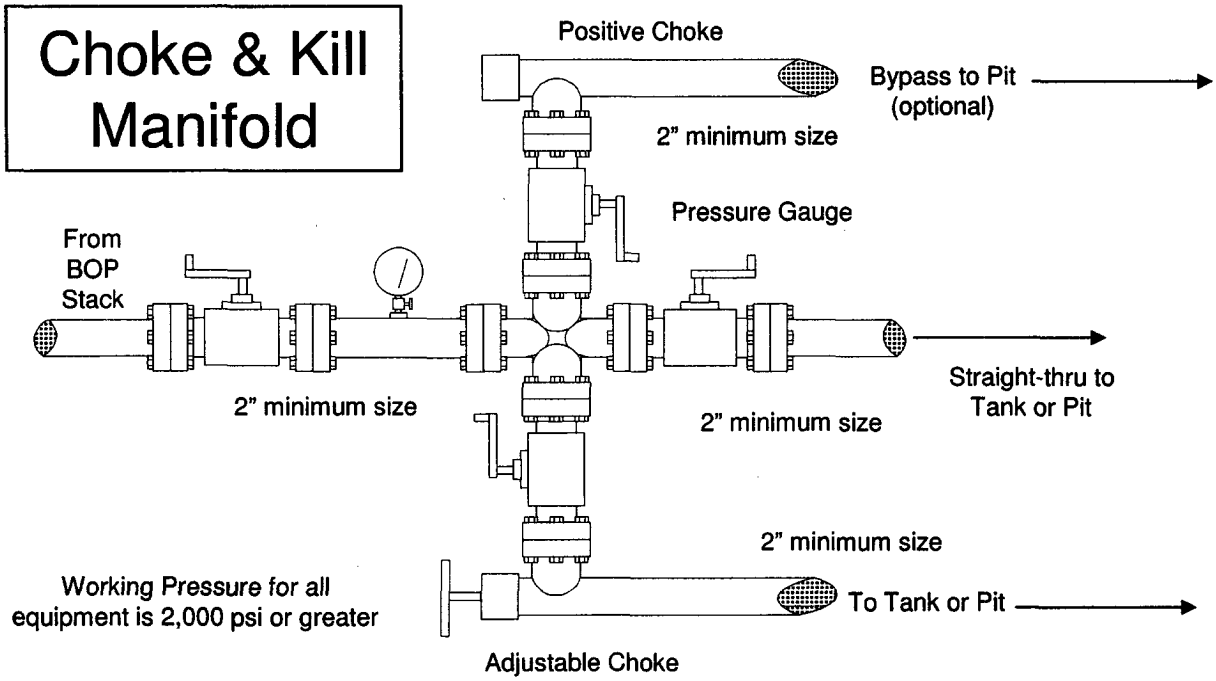
All ram type and annular preventers as well as related control equipment will be hydraulically tested to 250 psi (low pressure) and 2000 psi (high pressure), upon installation, following any repairs or equipment replacements, or at 30 day intervals. Accessories to BOP equipment will include kelly cock, upper kelly cock with a handle available, floor safety valves and choke manifold which will also be tested to equivalent pressure.



BP American Production Company

Well Control Equipment Schematic





Cementing Program

Well Name:	Ludwick LS 20M	Field:	Blanco Mesaverde / Basin Dakota
Location:	29-30N-10W, 1640 FNL, 1200 FWL	API No.	
County:	San Juan	Well Flac	
State:	New Mexico	Formation:	Dakota MesaVerde
		KB Elev (est)	6114
		GL Elev. (est)	6100

Casing Program:

Casing String	Est. Depth (ft.)	Hole Size (in.)	Casing Size (in.)	Thread	TOC (ft.)	Stage Tool Or TOL (ft.)	Cmt Cir. Out (bbl.)
Surface	200	13.5	9.625	ST&C	Surface	NA	
Intermediate	2957	8.75	7	LT&C	Surface	NA	
Production -	7205	6.25	4.5	ST&C	2857	NA	

Casing Properties: (No Safety Factor Included)

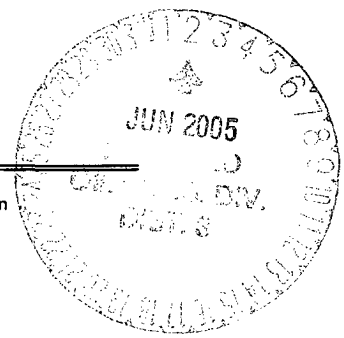
Casing String	Size (in.)	Weight (lb/ft)	Grade	Burst (psi.)	Collapse (psi.)	Joint St. (1000 lbs.)	Capacity (bbl/ft.)	Drift (in.)
Surface	9.625	32	H-40	3370	1400	254	0.0787	8.845
Intermediate	7	20	K-55	3740	2270	234	0.0405	6.456
Production -	4.5	11.6	J-55	5350	4960	154	0.0155	3.875

Mud Program

Apx. Interval (ft.)	Mud Type	Mud Weight
0 - SCP	Water/Spud	8.6-9.2
SCP - ICP	Water/LSND	8.6-9.2
ICP - ICP2	Gas/Air Mist	NA
ICP2 - TD	LSND	8.6 - 9.2

Recommended Mud Properties Prio Cementing:

PV <20
YP <10
Fluid Loss <15



Cementing Program:

	Surface	Intermediate	Production
Excess %, Lead	100	75	40
Excess %, Tail	NA	0	40
BHST (est deg. F)	75	120	183
Special Instructions	1,6,7	1,6,8	2,4,6

1. Do not wash pumps and lines.
2. Wash pumps and lines.
3. Reverse out
4. Run Blend Test on Cement
5. Record Rate, Pressure, and Density on 3.5" disk
6. Confirm densitometer with pressurized mud scales
7. 1" cement to surface if cement is not circulated.
8. If cement is not circulated to surface, run temp. survey 10-12 hr. after landing plug.

Notes:

*Do not wash up on top of plug. Wash lines before displacing production cement job to minmize drillout.

Surface:

Preflush	20 bbl.	FreshWater	
Slurry 1	170 sx Class G Cement		195 cuft
TOC@Surface	+ 3% CaCl2 (accelerator)		
	+ 0.25 #/sk Cellophane Flake (lost circulation additive)		0.4887 cuft/ft OH

Slurry Properties:	Density (lb/gal)	Yield (ft3/sk)	Water (gal/sk)
Slurry 1	15.8	1.16	4.95

Casing Equipment:

9-5/8", 8R, ST&C
1 Guide Shoe
1 Top Wooden Plug
1 Autofill insert float valve
Centralizers, 1 per joint except top joint
1 Stop Ring
1 Thread Lock Compound

Intermediate:

Fresh Water	20 bbl	fresh water	

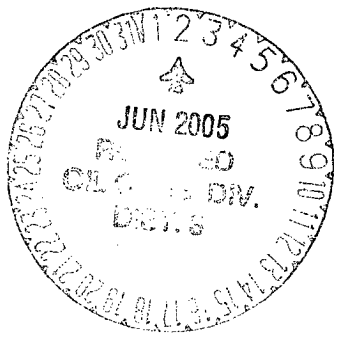
Cementing Program

Lead	240 sx Class "G" Cement		629 cuft
Slurry 1	+ 3% D79 extender		
TOC@Surface	+1/4 #/sk. Cellophane Flake		
	+ 5 lb/sk Gilsonite		
Tail	60 sx 50/50 Class "G"/Poz		75 cuft
Slurry 2	+ 2% gel (extender)		
500 ft fill	+1/4 #/sk. Cellophane Flake		0.1503 cuft/ft OH
	+ 2% CaCl2 (accelerator)		0.1746 cuft/ft csg ann
	+ 5 lb/sk Gilsonite		

Slurry Properties:	Density (lb/gal)	Yield (ft3/sk)	Water (gal/sk)
Slurry 1	11.4	2.63	15.8
Slurry 2	13.5	1.27	5.72

Casing Equipment: 7", 8R, ST&C

1 Float Shoe (autofill with minimal LCM in mud)
1 Float Collar (autofill with minimal LCM in mud)
1 Stop Ring
Centralizers one in middle of first joint, then every third collar
1 Top Rubber Plug
1 Thread Lock Compound



Production:

Fresh Water	10 bbl	CW100	
Lead	190 LiteCrete D961 / D124 / D154		470 cuft
Slurry 1	+ 0.03 gps D47 antifoam		
TOC, 400' above 7" shoe	+ 0.5% D112 fluid loss		
	+ 0.11% D65 TIC		
Tail	150 sx 50/50 Class "G"/Poz		206 cuft
Slurry 2	+ 5% D20 gel (extender)		
1432 ft fill	+ 0.1% D46 antifoam		
	+ 1/4 #/sk. Cellophane Flake		
	+ 0.25% D167 Fluid Loss		
	+ 5 lb/sk Gilsonite		
	+0.1% d800, retarder		
	+0.15% D65, dispersant		
			0.1026 cuft/ft OH

Slurry Properties:	Density (lb/gal)	Yield (ft3/sk)	Water (gal/sk)	0.1169 cuft/ft csg ann
Slurry 1	9.5	2.52	6.38	
Slurry 2	13	1.44	6.5	Top of Mancos
				5273

Casing Equipment: 4-1/2", 8R, ST&C
1 Float Shoe (autofill with minimal LCM in mud)
1 Float Collar (autofill with minimal LCM in mud)
1 Stop Ring
Centralizers, every 4th joint in mud drilled holes, none in air drilled holes.
1 Top Rubber Plug
1 Thread Lock Compound