Submit to Appropriate District Office State Lease — 6 copies Fee Lease — 5 copies

State of New Mexico Energy, Minerais and Natural Resources Department

Form C-101 Revised 1-1-89

DISTRICT I P.O. Box 1980, Hobbs, NM 88240

OIL CONSERVATION DIVIS P.O. Box 2088

DISTRICT II

CONSERVATION DIVISION	
	API NO. (assigned by OCD on New Wells)
P.O. Box 2088 Santa Fe, New Mexico 87504-2088	30-045-28170
	5. Indicate Type of Lease

O. Drawer DD, Artesia, NM 88210	STA	ATE L FEE XX
DISTRICT III 000 Rio Brazos Rd., Azzec, NM 87410	6. State Oil & Gas Lease N	ło.
APPLICATION FOR PERMIT TO DRILL, DEEPEN, OR PLUG BACK		
. Type of Work:	7. Lease Name or Unit Ag	reement Name
DRILL X RE-ENTER DEEPEN PLUG BACK		
. Type of Well: Oil GAS SINGLE MULTIPLE	Gallegos Can	von Unit
WELL X OTHER ZONE ZONE	1	yon onre
Name of Operator BHP Petroleum (Americas) Inc.	8. Well No.	160
Address of Operator	9. Pool name or Wildcar	160
5847 San Felipe Suite #3600 Houston, Texas 77057-9972	W. Kutz Pict	ured Cliffs
Well Location D 990 Feet From The N Line and 1130) Feet From The	W Li
Section 28 Township 29N Range 12W	NMPM San Juan	County
<i>\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\</i>	Formation Pictured Cliffs	12. Rotary or C.T.
3. Elevations (Show whather DF, RT, GR, etc.) 14. Kind & Status Plug. Bond 15. Drilling Contract		Rotary Date Work will start
GR 5328' Blanket Unknown		11 1990
PROPOSED CASING AND CEMENT PROC	SRAM	
SIZE OF HOLE SIZE OF CASING WEIGHT PER FOOT SETTING DEPTH	SACKS OF CEMENT	EST. TOP
	SACING OF OFFICE	E31. 10F
8 3/4" 7" 20# ±130'	50 sx(57.5cu.f	t) Surface
8 3/4" 7" 20# ±130' 6 1/4" 4 1/2" 10.5 ±1417'	50 sx(57.5cu.f 180sx(221cu.ft	t) Surface) Surface
8 3/4" 7" 20# ±130' 6 1/4" 4 1/2" 10.5 ±1417' It is proposed to drill the subject well to 1417' with the anticipated in the Pictured Cliffs. Estimated Formation Tops: Kirtland Fruitland Basal Fruitland Coal Pictured Cliffs T.D.	50 sx(57.5cu.ft 180sx(221cu.ft ne primary product 47' 908' AUG2 1210' OIL CO 1267' 1417' DIS	t) Surface Surface tion 7 1990 N. DIV.
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INDEPUTY OIL & GAS INSPECTOR, DIST. #3

_ DATE AUG 28 199()

CONDITIONS OF APPROVAL IF ANY:

APPROVAL EXPIRES 2-28-91 UNLESS DRILLING IS COMMENCED. SPUD NOTICE MUST BE SUBMITTED WITHIN 10 DAYS.

Submit to Appropriate District Office State Lease - 4 copies Fee Lease - 3 copies

State of New Mexico Energy, Minerals and Natural Resources Department

Perm C-162 Ravised 1-1-89

DISTRICT | P.O. Bux 1980, Hobbs, NM 88240

OIL CONSERVATION DIVISION P.O. Box 2088

DISTRICT II P.O. Drawer DD, Artesia, NM 88210

DISTRICT III 1000 Ruo Brazos Rd., Azzec, NM 87410 Santa Fe, New Mexico 87504-2088

WELL LOCATION AND ACREAGE DEDICATION PLAT

BHP PETROLEUM (AMERICAS) INC. GALLEGOS CANYON UNIT Social Township 28				All Distan	ces must be		uter bounds	ries of the sect	lo n		···	
Township 29 N Range 12 W NMFM San Juan North Inse and 1130 feet from the Producing Formation Pool Outline the arreage dedicated to the abject well by colored pencil or hadrium marks on the pital below 2 If more than one lease is dedicated to the well, outline each and identify the conventibly therroof (both as to working minerat and royalty). 3. If more than one lease is dedicated to the well, outline each and identify the conventibly therroof (both as to working minerat and royalty). 3. If more than one lease of different ownership is dedicated to the well, have the interest of all owners been consolidated by communitization, force-propring, sc. 7 Yes No		ROLE	eum (an	MERICAS) INC	•	Lease GA	LLEGOS	CANYON UI	NIT		Well No. 501	
D 28 29 N 12 W NMPM San Juan mail focuses Location of Well: 900 feat from the North line and 1130 feat from the West Line 1. Outline the acreage dedicated to the subject well by colored pencil of bachure marks on the plat below. 2. If more than one lease of different ownership is dedicated to the well, outline each and identify the ownership thereof (both as to working interest and royalty). 3. If more than one lease of different ownership is dedicated to the well, have the interest of all owners been consolidated by communications, force-pooling, one-pooling, eac.? Yes In Juan Williams of the well until all interests have been consolidated (Use reverse nice of this form if necessary.) No allowable will be assigned to the well until all interests have been consolidated (Use reverse nice of this form if necessary.) No allowable will be assigned to the well until all interest, has been approved by the Division. 3. Seg* 54 Iv. 39.928c. Seg* 48 iv. 39.952c. AUG 2.7 1990 OIL CON. DIV. 1. Marrier yearily that the well location the marrier of that the subject to the start of my baconing and bring. Ball Petroleum (Americas) Date 1. Marrier yearily that the well location the marrier of that the same is marrier of the base of my baconing and bring. Ball Segregation and that the same is marrier of the base of my baconing the marrier of my baconing to the same is marrier to the base of my baconing to the same is marrier to the base of my baconing to the same is married to the same in the same is married to the sa			· · · · · ·			1				County		
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Or until a non-standard unit, eliminating such instanta, has been approved by the Division. See 10 100 100 100 100 100 100 100 100 10	3. If more th unitization If answer is this form if i	nan one n, force fes "no" l: necces	e lease of di e-pooling, st ist the owne	fferent ownership is detect. No If answers and tract description	edicated to the ver is "yes" types which have	e well, have pe of consol actually be	the interest o	f all owners bee	n con	solidated by com	munitizacion,	
OPERATOR CERTIFICATION S89°54'W 39.952cu AUG 27 1990 OIL CON. DIV. AUG 27 1990 OIL CON. DIV. Willtark & Mainte II Signatury and that the well location should survey made by me or under surpervision, and that the same is true contained survey. Willtark & Mainte II Signatury BHP Petroleum (Americas) Date 8/22/90 SURVEYOR CERTIFICATION I hereby cartify that the well location should not be a survey made by me or under supervision, and that the same is true contained surveys made by me or under supervision, and that the same is true contained surveys made by me or under supervision, and that the same is true contained surveys made by me or under supervision, and that the same is true contained surveys made by me or under supervision, and that the same is true contained surveys made by me or under supervision, and that the same is true contained surveys made by me or under supervision, and that the same is true contained surveys made by me or under supervision, and that the same is true contained surveys made by me or under supervision, and that the same is true contained surveys made by me or under supervision, and that the same is true contained surveys made by me or under supervision, and that the same is true contained surveys made by me or under supervision. Surveys surveys and surveys surveys surveys the surveys the surveys surveys the surveys surveys the surveys surveys the survey	or until a no	0- 611 0	dard unit, el	iminating such interes	, has been ap	proved by the	ne Division.		DUZZU	Total pooli	ig, or otherwise)
contained herein in true and complete to beast of my knowledge and belief. Signification Princed Name Chuck Williams Position Field Services Administr Company BHP Petroleum (Americas) Date 8/22/90 SURVEYOR CERTIFICATION I hereby certify that the well location shoon this plat was plotted from field ancient surpervision, and that the same is true contained surveyed with the same is true contained. OIL CON. DIV. DIST. 3 Contained herein is true and complete to beast of my baselings Princed Name Chuck Williams Position Surveyor CERTIFICATION I hereby certify that the well location shoon this plat was plotted from field ancient surveyer made by me or under supervision, and that the same is true contained. Surveyed Williams Position AUG 2 7 1980 OIL CON. DIV. Surveyed Williams Professional Surveyed Williams Professional	30 660 340	1320	HE GO I	230 2640	2000	1800	1000	500	0	OPERA?	OR CERTI	FICATION
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Finited Name Chuck Williams Position Field Services Administr Company BHP Petroleum (Americas) Date 8/22/90 SURVEYOR CERTIFICATION I hereby certify that the well location show this plat were plotted from field notes actual surveye made by me or under supervisor, and that the same is true correct to the best of my branwledge belief. 8-16-90 Date Surveyed William E: Walanke II Signature Aleart Professional Surveyor IE Washed	777		/ /	/ / Fd.					I			
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BHP PETROLEUM (AMERICAS) INC. GALLEGOS CANYON UNIT NO. 509 990' FNL & 1130' FWL SECTION 28 T29N-R12W SAN JUAN COUNTY, NEW MEXICO TEN POINT PROGRAM

1. Surface Formation: Ojo Alamo

2 &

3. Estimated Formation Tops:

<u>Formation</u>	Top	Expected Production
Kirtland Fruitland Basal Fruitland Coal Pictured Cliffs	47 908 1210 1267	Gas Gas
Total Depth	1417	

Casing and Cementing Program: A string of 7" 20# K-55 casing 4. with ST&C couplings is to be set at ±130' in an 8 3/4" hole and cemented to the surface in a single stage with 50 sx Class 'H' cement (yield = 1.15 ft 3 /sx) containing 3 % CaCl₂ and $\frac{1}{4}$ #/sx celloflake. Slurry volume assumes a 100 percent excess over calculated hole volume. Centralizers will be run on the bottom two joints as long as boulders are not encountered while drilling the surface hole. If boulders are encountered while drilling the surface hole, no centralizers will be run as it has been BHP P(A)'s experience centralizers have a tendency to knock off boulders and hang up the casing while running in the hole. Minimum clearance between collars and hole is 1.094". Prior to drilling out shoe, casing and BOPE will be tested to a minimum of 2000 psi. Safety factors utilized in the design of this casing string were: Burst = 1.1, Collapse = 1.125, and Tension = 1.8 or 100,000# overpull whichever was greater.

A production string of $4\frac{1}{2}$ " 10.5# K-55 casing with ST&C couplings will be run from the surface to total depth in a $6\frac{1}{4}$ " hole. This string will be cemented to the surface with a minimum of 130 sx of 50-50 pozmix containing 2 % gel, 0.5 % fluid loss additive and $\frac{1}{4}$ #/sx celloflake (yield = 1.26 ft³/sx) followed by 50 sx of Class 'G' cement containing low fluid loss additives (yield = 1.15 ft³/sx). Slurry volume assumes a 50 percent excess over calculated hole volume. Cement volume is subject to change after review and recalculation of

hole volume from the open hole calipers. Centralizers will be spaced such that a minimum of two are located above and two are located below the Basal Fruitland Coal; and, if any Ojo Aloma is present in the open hole section at the top of the hole, a minimum of one centralizer will be run just below the base and another into the base of Ojo Alamo. Minimum clearance between collars and hole is 1.25". Prior to perforating the casing for any attempted completion, the casing will be tested to a minimum of 2500 psi. Safety factors utilized in the design of this casing string were: Burst = 1.1, Collapse = 1.125, and Tension = 1.8 or 100,000# overpull whichever was greater.

A chronological log following the completion of the cementing operations detailing the pump rate, pump pressure, slurry density, and slurry volume for each job will be submitted in a Sundry Notice.

Pressure Control Equipment: (See attached schematic diagrams)
A minimum of a 2M BOPE well control system will be utilized.
BOP's and choke manifold will be installed and pressure tested before drilling out under surface casing and then will be checked daily as to mechanical operation condition. Ram type preventors will be tested to 70 percent of the internal yield pressure of the casing. The annular preventor will be tested to 50 percent of its working pressure.

A full opening internal blowout preventor or drill pipe safety valve will be on the drilling floor at all times and will be capable of fitting all connections.

6. Mud Program: A fresh water Low Solids, Non-Dispersed mud system will be used to drill this well. Sufficient materials will be on location at all times to maintain mud properties and to control any unforeseen lost circulation problems or abnormal pressures in the Farmington Sands of the Kirtland Formation. All drilling fluids will be contained in a steel pit. At the completion of drilling, the drilling fluid will be hauled off to be used for another well. The remaining accumulation of solids in the pit will be dumped into a small earthen pit beside the steel pit. As soon as this pit dries up, it will be covered up.

Mud program summary is as follows:

<pre>Interval (feet)</pre>	Mud Weight(#/gal)	Viscosity <u>(sec/qt)</u>		
0 - 1000	8.4 or less	30 - 38		
1000 - TD	9.3 or less	40 - 55		

7. Auxiliary Equipment:

An upper Kelly Cock will be utilized. At a minimum, a flow sensor will be installed in the system and the mud volume constantly be visually monitored.

8. <u>Logging Program:</u> SP-DIL and GR-FDC-CNL logs will be run from TD to surface casing shoe.

Coring Program: No cores are planned.

Testing Program: No tests are planned.

<u>Stimulation Program:</u> Perf the Basal Fruitland Coal with 2 JSPF and frac with 50,000 gals of either a 70 quality nitrogen foam or a crosslinked-gelled water containing a minimum of 50,000 lbs of 20-40 mesh sand.

9. <u>Abnormal Pressure:</u> Although not expected, abnormal pressures are possible in the Farmington Sands of the Kirtland Formation.

Estimated Bottom Hole Pressure: 400 psi.

10. Anticipated Starting Date: As soon as all required approvals are received.

<u>Duration of Operation:</u> It is anticipated a total of 4 days will be required for drilling operations and 5 days for completion operations.

2M SYSTEM



