District I
PO Box 1980, Hobbs, NM 88241-1980
District II
PO Drawer DD, Artesia, NM 88211-0719
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-101
Revised February 10, 1994
Instructions on back
Submit to Appropriate District Office
State Lease - 6 Copies
Fee Lease - 5 Copies

☐ AMENDED REPORT

APPLICATION FOR PERMIT TO DRILL, RE-ENTER, DEEPEN, PLUGBACK, OR ADD A ZONE

[1] Operator Name and Address.	[2] OGRID Number
Coastal Management Corporation P. O. Box 2726 Midland, TX 79702	127951
	[3] API Number 30 - 025-32970

[4] Property Code	[5] Property Name	[6] Well No.
17110	Lowe 27	1

[7] Surface Location

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
O	27	12S	37E		642	South	2434	East	Lea

[8] Proposed 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

[9] Proposed Pool 1	[10] Proposed Pool 2
Southwest Gladiola Devonian	Southwest Gladiola (Wolfcamp)

[11] Work Type Code	[12] Well Type Code	[13] Cable/Rotary	[14] Lease Type Code	[15] Ground Level Elevation
N	O	R	P	3892
[16] Multiple	**[17] Proposed Depth**	**[18] Formation**	**[19] Contractor**	**[20] Spud Date**
N	12,200	Devonian	XIADRIL	6/15/95

[21] Proposed Casing and Cement Program

Hole Size	Casing Size	Casing weight/foot	Setting Depth	Sacks of Cement	Estimated TOC
17 1/2	13 3/8	54.5	400	425	Surface
12 1/4	8 5/8	32	4500	1510	Surface
7 7/8	5 1/2	17	12,200	500	9600

[22] Describe the proposed program. If this application is to DEEPEN or PLUG BACK give the data on the present productive zone and proposed new productive zone. Describe the blowout prevention program, if any. Use additional sheets if necessary.

Proposed drilling program outlined in Item 21 above. Operator accepts risk of drilling location contingent upon approval of non-standard location.

Blowout prevention program attached.

Approval for drilling only -- CANNOT produce until Non-Standard Location is approved.

[23] I hereby certify that the information given above is true and complete to the best of my knowledge and belief.

Signature: Linda Johnston

Printed name: Linda Johnston

Title: Agent

Date: 5/18/95 Phone: (915) 694-8228

OIL CONSERVATION DIVISION

Approved by: ORIGINAL SIGNED BY JERRY SEXTON

Title: DISTRICT I SUPERVISOR

Approval Date: MAY 23 1995 Expiration Date:

Conditions of Approval:
Attached ☐

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

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

DISTRICT III
1000 Rio Brazos Rd., Aztec, NM 87410

State of New Mexico
Energy, Minerals and Natural Resources Department

Form C-102
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Fee Lease - 3 Copies

OIL CONSERVATION DIVISION

P.O. Box 2088
Santa Fe, New Mexico 87504-2088

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

API Number	Pool Code	Pool Name
30-025-32970	27760	Southwest Gladiola Devonian

Property Code	Property Name	Well Number
17110	LOWE 27	1

OGRID No.	Operator Name	Elevation
127951	COASTAL MANAGEMENT CORPORATION	3892

Surface Location

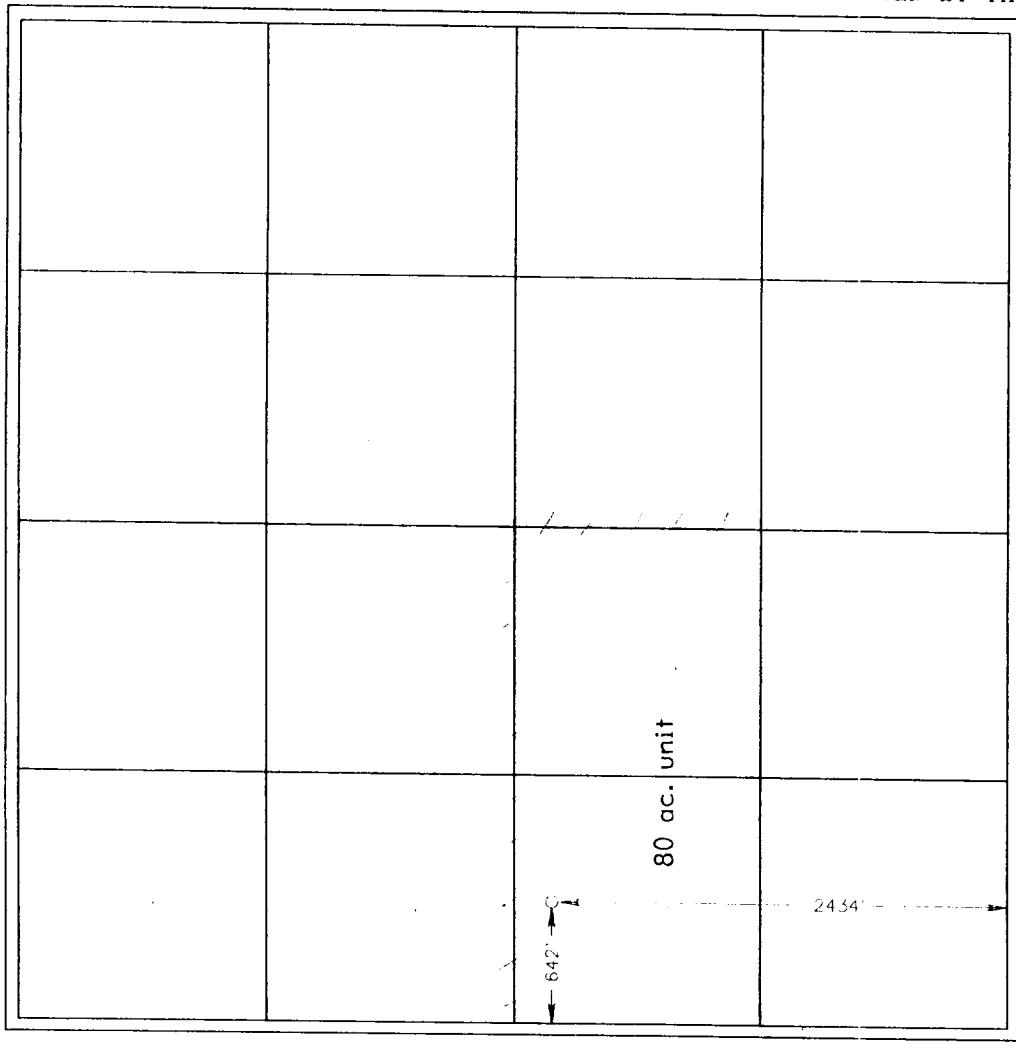
UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
O	27	12 S	37 E		642	SOUTH	2434	EAST	LEA

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

Dedicated Acres	Joint or Infill	Consolidation Code	Order No.
80			

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



OPERATOR CERTIFICATION

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

Signature: Linda Johnston

Linda Johnston
Printed Name

Agent
Title

5/18/95
Date

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 supervison, and that the same is true and correct to the best of my belief.

MAY 12, 1995
Date Surveyed MST

Signature & Seal of Professional Surveyor

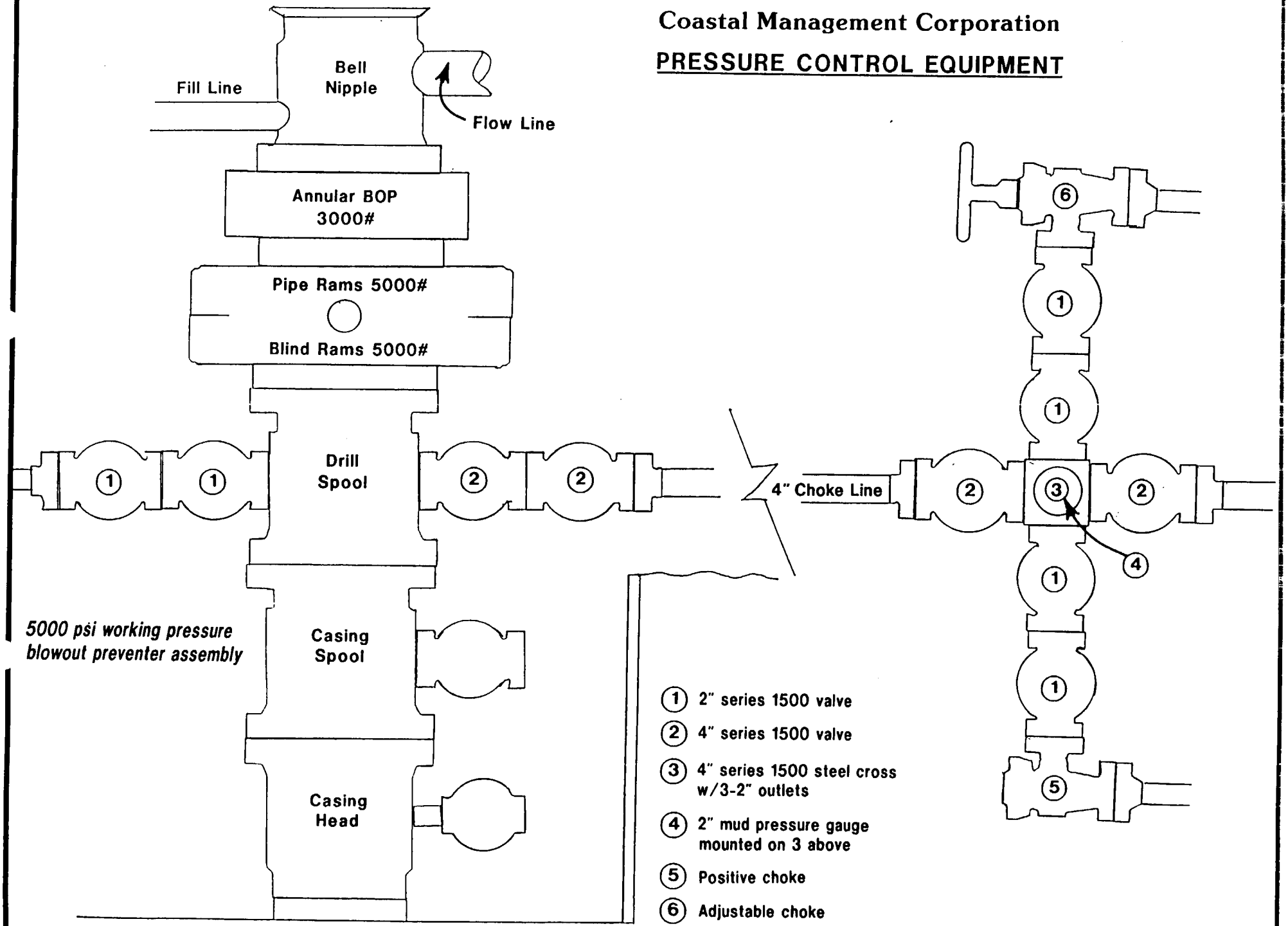
Ronald J. Eidson 5-16-95

W.O. Num. 95-11-0787

Certificate No. JOHN W. WEST, 676
RONALD J. EIDSON, 3239
GARY G. EIDSON, 4735

Coastal Management Corporation

PRESSURE CONTROL EQUIPMENT



5000 psi working pressure blowout preventer assembly

1. 2" series 1500 valve
2. 4" series 1500 valve
3. 4" series 1500 steel cross w/3-2" outlets
4. 2" mud pressure gauge mounted on 3 above
5. Positive choke
6. Adjustable choke

COASTAL MANAGEMENT CORPORATION
P. O. Box 2726
Midland, TX 79702

May 18, 1995

New Mexico Oil Conservation Division
Oil and Gas Drilling Permits
P. O. Box 2308
Santa Fe, NM 87503-2308

Re: Non-standard drilling location
Lowe 27 Well No. 1
Unit O Sec. 27, T12S, R37E
Lea County, NM
642' From South Line and 2434' From East Line
Total Depth: 12,200'
Formation at TD: Devonian

Gentlemen:

We are requesting approval of non-standard location for the above mentioned well. We have filed application for permit to drill to Hobbs District Office. The reason for this request is based on 3D seismic interpretation and we have a limited target area as the east side of location is bounded by a fault and there are structural limitations on the west side of the location.

Your prompt response to this request is greatly appreciated.

Yours very truly,

Linda Johnston, Agent
(915) 694-8228

Attachments

cc: NMOCDHobbs-

WELL CONTROL GUIDELINES

PRESSURE ANOMALLY CONTROL PROCEDURES

If trip gas cuts mud weight, circulate until mud has leveled out or another procedure is indicated. If mud weight has been cut while drilling, do not make trip before mud has been leveled out for two (2) complete circulations.

If an unexplained increase in mud volume, stand pipe pressure, or increased pump strokes is noted, the following procedure will be pursued:

1. Pick up Kelly, open choke line, stop the pump, close BOP, then close the choke. Do not allow choke to be open but for a moment.

2. Read the record the shut in stand pipe pressure. If the pressure is less than 200 psi, it will not be indicated on a 6,000 psi standpipe gauge and a smaller gauge may be required. A 0-1,000 or 0-2,000 psi gauge should be available for these lower readings.

3. Read the record the shut-in annulus pressure.

4. Read and record the mud volume gain in the pits. If a recording pit level device is used, this will provide a direct reading.

5. Open the annulus and bleed a little mud to see if any pressure was trapped during the shut-in operation; usually less than one barrel is required. If any pressure is trapped, drill pipe and annulus pressure will be reduced after bleeding; the annulus should be bled as long as these pressures decline. If drill pipe pressure does not decrease, cease bleeding. Record all pressures and pit volume changes during the bleeding process and use the lowest shut-in pressures for subsequent calculations.

6. Keep pipe moving <u>after</u> pressures are determined. Reciprocating pipe slowly will reduce the chances of sticking the pipe.

7. Calculate the increase in mud weight needed from the shut-in standpipe pressure using the following formula:

   <u>Shut-in standpipe pressure</u>
   0.52 x length or drill string = increase in mud weight lb/gal

8. Determine "feet of contaminant" (Column height) from the pit volume gain using the following formula:

   Ft of Contaminant - Pit Volume gain (lbs.) x capacity of bottom annular section (ft./bbl.)

   The contaminant may occupy more than one interval if the pit volume gain is excessive; if the gain is greater than the capacity (bbls.) of the drill collar annulus, the difference (surplus) must be used to calculate the contaminant in the next annulus interval.

9. Determine the gradient of the contaminant from the feet of contaminant, shut in pressures, and gradient of the drilling mud using the following formula:

$$\text{Gradient of the Contaminant} - G_{dm} - \frac{P_a - P_{dp}}{\text{Ft. of Contaminant}}$$

G_{dm} = Gradient of Drilling Mud, psi/ft.

P_a = Shut in Annulus Pressure, psi

P_{dp} = Shut in Drill Pipe (Standpipe) Pressure, psi

If the gradient is .1 - .14 psi/ft., the contaminant is gas; if the gradient is .4 - .5 psi/ft., the contaminant is salt water; if the gradient is between .15 and .4 psi/ft., the contaminant is a mixture of gas and salt water or oil.

If the contaminant contains gas, the mud weight in the suction pit should be increased before circulating. If the contaminant is salt water, the contaminant can be circulated into the casing before increasing the mud weight.

10. <u>Increase mud weight in suction pit only.</u> This will reduce the mud conditioning time to a minimum. Adjust pit volumes by transferring mud so that adjustments will not be required during the killing circulation. While mixing mud, observe and record standpipe and annulus pressures. Gas may rise in the annulus; this rate has been measured on shut in wells and averages 4 to 6 ft. per minute in mud and as high as 20 ft. min. in water. The rise of the gas will equally increase both standpipe and annular pressures; this pressure can be relieved if absolutely necessary by bleeding the annulus without allowing the drill pipe pressure to approach initial shut in pressures. Pressure should only be relieved when pressures reach a critical point which would cause formation fracturing, etc., and you are sure the drill pipe is full of mud. If the standpipe pressure increase is greater than the annulur pressure increase, contaminant may have entered the drill pipe pumping a <u>few</u> barrels of mud into the drill pipe will determine this, holding annular pressure constant.

<u>CIRCULATING OUT CONTAMINANT:</u>

We have calculated the mud weight required and we know what the contaminant is and from the previous discussion we have some idea of the configuration of the back pressure schedule and pit volume change.

1. Determine a pumping rate to allow accurate control of mud weight in suction pit. This rate will vary, depending on the type of missing equipment available on the rig. The mud weight in the suction pit should not vary more than .1 bbl/gal while circulating the well to insure accurate back pressure control.

2. Start pumping and adjust choke setting to maintain the initial shut in annulus pressure.

3. Maintain constant pump rate while displacing the drill pipe with kill mud, observe and record the standpipe pressure, pit volume, mud weight in and out, and any other pertinent date. The standpipe pressure will change as the kill mud displaces the lighter weight drilling weight drilling mud in the drill pipe; this change should be a decrease unless a restriction develops in either the drill pipe or annulus.

4. If the pit level increased during the displacement of mud in the drill pipe, shut the well in and get a new starting point in the same manner used at initial shut in. Usually the pipe level will not change in the initial stages of circulation if the contaminant was on bottom when the well was shut in. If the contaminant was near the surface, pipe volume increase will occur.

5. When 50% of the drill pipe has been displaced with kill mud, shut the well in and obtain shut in pressures. The number of pump strokes required to fill the drill pipe should be known and if a pump stroke counter is not used, the strokes can be estimated from pump rate. If kill mud weight is correct, the shut in standpipe pressure will be 50% of the initial standpipe pressure. This step is not absolutely necessary but is merely a check on initial calculations, if for some reason shutting the well in is not desirable, this step can be omitted. <u>After any shut in period, check for trapped pressure and use the observe annulus pressure as the back pressure when circulation is resumed.</u>

6. When the drill pipe mud has been completely displaced, shut the well in again and read the shut in pressures. If the kill mud weight is correct, the standpipe pressure will be zero. If the standpipe pressure is not zero, the mud weight can be adjusted using this pressure and the same calculations as before. If the pressure is 100 psi or less, the operations can continue and the mud weight adjustments can be made on the next circulation. (Too many adjustments in the mud weight and excessive shut in periods are not desirable as they complicate the killing operations.)

7. Resume pumping, using the annulus shut in pressure as the starting back pressure; <u>maintain pump speed constant</u> and observe and record standpipe pressure. Maintain the standpipe pressure constant; <u>not by varying pump speed,</u> but by regulating back pressure with chokes this is the constant drill pipe technique. The standpipe pressure may fluctuate as much as 200 psi per pump stroke on some rigs, but this does not effect the accuracy; use either the maximum or minimum reading throughout the circulation -- the maximum reading is preferred. Standpipe pressure will fluctuate when reciprocating the pipe too fast; if pipe movements ~~are~~ <u>very</u> slow, the pressure affects will be minimized.

To get the "feel" for this part of the operations, it is necessary to realize that the hole with drill pipe in it constitutes a U tube - the drill pipe is one side and the annulus on the other side of the tube. We know the drill pipe side will overcome the formation pressure if the shut in standpipe pressure was zero when it was full of kill mud, and the annulus side will do the same if we get it full of kill mud. With this in mind, we can now forget about the bottom hole pressure and concentrate on keeping this U tube balanced while we circulate it.

To circulate, we must overcome friction caused by circulating through the drill pipe, drill collars, bit jets and the annulus. These restrictions to flow will be represented by the standpipe pressure. Most are from the drill pipe side of the U tube; the friction pressures in the annulus will be a small percentage of the total standpipe pressure.

<u>If we maintain the mud weight and circulation rate constant on the drill pipe side,</u> the standpipe pressure should remain constant unless pressures change on the annular side of the U tube; therefore, all that is required is to maintain the standpipe pressure constant by maintaining the annular pressures constant. But conditions on the annular side will be changing; kill mud is replacing drilling mud, thereby increasing the pressure; expanding gas displace mud from the annulus resulting in decreased pressure. <u>Varying the back pressure</u> to compensate for the changes will keep the U tube balanced. We can consider the standpipe pressure as a reading of the weight of the annulus; if the standpipe pressure increases, the annulus is too heavy and back pressure must be reduced; if the standpipe pressure decreases, the annulus is not heavy enough and back pressures must be increased. Maintaining this procedure throughout the circulation will result in killing the well in one circulation if we don't encounter a leak in the U tube.

A lack of standpipe pressure response to back pressure changes, accompanied by abnormal mud pit volume changes, usually indicated a leak on the annular side; the pressure response will be the first indication and the best solution is to mix filler material (lost circulation material) and maintain circulation if possible.

8. Record at <u>very frequent</u> intervals:

A. Mud weight in suction pit
B. Mud weight downstream from choke
C. Strokes per minute of the mud pump
D. Total pump strokes
E. Surface pit volume changes
F. Back pressures
G. Standpipe pressure

9. When one circulation is completed, the back pressure should be zero and mud weight out should be within .5 lb/gal of the mud weight in the suction pit and the pit volume should be leveled out. Very often after one circulation, the back pressure will not be zero and the mud weight out will still be cut by the contaminant. Shutting the well in again will determine whether the back pressure should be adjusted; more circulation may be required to clean up the annulus. Do not open the well <u>unless all factors indicate the well is under control.</u>

10. If the back pressure is not zero after circulating but the mud weight and pit level indicate that the well is dead, circulate the well and slowly reduce the back pressure. If the contaminant was gas, a small initial rise in pit volume can be expected which is caused by expansion of the remnants of the gas adhering to the well of the hole or entrained in the mud. The pit volume should stabilize rapidly if the well is dead; if it continues to rise, back pressure should be increased, possibly another shut in to determine the proper back pressure.

11. If the well appears to be dead and back pressure is released, open well or divert returns through a 2" or 4" line and increase pump strokes to normal operating speed and circulate the annulus volume. If the pit volume stabilizers and mud weights are equalized, increase the mud weigh in the entire system enough to allow tripping.

12. When gas reaches the surface and is vented, back pressures and pit volume will change very rapidly. If the choke equipment is not capable of making these changes as needed, the circulation rate may have to be reduce. Establish a new drill pipe pressure at reduced speed may require shutting in the well, but a drill pipe pressure can be estimated if sufficient data was recorded prior to the kick. On each bit run, record the standpipe pressure at each pump stroke change for slow pump speeds. This information can be used to estimate the proper standpipe pressure for any pump stroke change required. Usually 50 psi per stroke change is close but it should be actually measured on each bit change.

    Allowing the pit volume to increase during a gas kick is very difficult the first time and the tendency of the inexperienced is to abandon the standpipe pressure and concentrate on leveling out the pit volume. This is when most wells are lost because maintaining a constant pit volume requires increased back pressure which usually results in formation fracturing and an underground blowout. If in doubt any time, <u>shutting</u> the well in will provide the proper back pressure reading and a <u>new starting point;</u> more hole damage can result from improper back pressure than shutting the well in - if it is shut in properly.

TRIP GAS:

Gas accumulation in the hole during trips is most common when drilling underbalanced. This gas is circulated out by applying constant drill pipe pressure technique used for controlling kicks, except that no mud weight increase is required and the drill pipe pressure can be used from the start for determining back pressure.

1. *Out of hole and pressure on the well*

   If the fillup on the trip appears to be normal, bleed well carefully to determine that rate of flow; the flow may be small enough to allow the pipe to be run back in the hole. This is an exceptional case and requires accurately measuring the flow and predicting the trip time. If the flow is excessive, strippping or snubbing in is required; this is the job of a service company such as Otis Engineering.

2. *Partially out of hole and well flowing*

   Install an inside preventor if a float is not in the string, and return to bottom by stripping in through the hydril if pressures are low enough. If pressures are high enough to over come the weight of the pipe, snubbing in is the only resort.

3. *Drill pipe parted during killing circulation*

   Determine the length of pipe which can be circulated; the contaminant could be above the parted joint. If the contaminant is above, the standpipe pressure will be less than the annular pressure or zero and continued circulation will kill the well or reduce the pressure. If the contaminant is below the parted joint, the pressures may be reduced by increasing the mud weight required to reduce the pressure using the footage of intact pipe in Equation (1).

   EXAMPLE: Pipe parted at 3,000 ft.

Standpipe Pressure	*1,500 psi*
Mud weight in pipe	*10 lb/gal.*

   Mud weight increase required: $\frac{1,500}{.052 \times 3,000}$

   9.6 lb./gal.

   Kill mud required = 10 + 9.6 = 19.6 lb./gal.

   This will not kill the well but will reduce their pressure so that a trip can be made to engage the first and resume circulation. If the mud weight increase cannot be made, a snubbing operation is required.