(c) the hole take. enough mud to replace the pipe :tal as it is pulled.

Make short trips as necessary. The following procedure should be used for short trips and regular trips:

(1) Slug the drill pipe with heavy mud so the pipe will pull dry.

(2) Fill the hole after the first five stands. Count the pump strokes required to fill. The hole should take the following amount of mud:

| Drill Pipe Size | Nominal Lbs./Ft. | Bbls. Per 90' Stand |
|---|---|---|
| 4-1/2" | 16.60 | .58 |
| 4-1/2" | 20.0 | .70 |
| 5" | 19.50 | .68 |

(3) Thereafter, fill the hole at least every 10 stands. Count pump strokes and see that it takes the right amount of mud. Also, watch the pit level decline to see that the hole is taking enough mud. Fill the hole after each stand of drill collars is pulled.

(4) Run back to bottom if the hole fails to take enough mud. Circulate out using the procedure recommended for Trip Gas, Section C.

## E. DRILLING BREAKS

(1) When a drilling break is encountered, 4 min./ft. or faster for 5 ft., shut off the pump. If mud returns continue, follow the procedure in Section F, Mud Gains While Drilling.

(2) If the mud returns cease, continue drilling but follow the tip gas procedure of Section C.

(3) Check for flow during the next connection.

## F. MUD GAINS WHILE DRILLING

(1) If the pit level rises while drilling and the rise cannot be attributed to trip gas or additions to the mud system, shut down the pump immediately.

(2) With the annulus choke open, pick up and close the Hydril on a joint of drill pipe or close the rotating head outlet. Then close the annulus choke. (Subject to the pressure limitations of the casing and surface equipment.)

(3) Immediately read and record the stabilized shut-in pipe and casing pressures.

(4) If drill pipe pressure is zero, follow the trip gas procedure of Section C.

(5) If there is pressure on the drill pipe, as soon as possible open the annulus choke and start circulating at normal or reduced circulating rate as dictated by the required circulating pressure as determined in step (1).

(6) Regulate the annulus choke while circulating at a constant rate so as to maintain a constant drill pipe pressure equal to the total of:

(a) The normal circulating pressure for the circulating rate selected,
plus (b) the shut-in drill pipe pressure as determined in F (3) above, and
plus (c) a safety margin of 200 psi.