INDICATION OF EMERGENCY

There are numerous signs which may indicate an approaching emergency. If these signs are detected in time and recognized as a warning, there is no valid reason for a well getting out of control. All crew memebers must always be alert and trained to recognize these signs.

Listed below are a number of indications which may be forerunners of trouble, and must be checked out when they occur:

- Fluid rise in pits (which indicates well is unloading) may be caused 1. by (1) hydrostatic mud weight being too light, (2) formation fluid or gas entering bore hole, (3) accumulation of air from past trip being circulated to surface, or (4) lost circulation zone flowing mud back into bore hole during trip.
- increase in pump speed or decrease in pump pressure while drilling may be caused by (1) formation fluid or gas entering the bore hole and lightening the mud column, (2) mud pump not functioning properly, or (3) washed out drill pipe or drill collars. 3.
- A drilling break in a known or suspected productive interval.
- Mud continuing to flow from bore hole after pumps are stopped may be caused by (1) formation fluid or gas entering bore hole, or (2) from an unbalanced mud column (heavy mud having been pumped into dfill pipe and lighter mud in the annulus). 5.
- Continued flow of mud from drill pipe when tripping, or drill pipe failing to dry up when pulling. 6.
- Decrease in mud weight because of gas cutting.
- Hole not taking proper amount of mud when tripping out of the hole 7. may be caused by (1) swabbing action of drill string and bit, or (2) an insufficient mud weight over-balance on formation when pump
- Loss of circulation, causing a lowering of fluid in the hole, which decreases hydrostatic pressure and may allow formation fluid or gas 9.
- While drilling, circulating, or tripping, any unusual condition occurring which cannot be quickly identified or explained.

EMERGENCY PROCEDURE

When the driller has decided a blowout threatens from any of the abovementioned items, he should follow procedures used in blowout prevention drills. In addition, he should contact his supervisor as soon as possible, who in turn should contact Pennzoil's supervisor.

Contractor's and Pennzoil's supervisors should agree in advance on procedures to be followed. If agreed upon, Pennzoil's "Emergency Procedure for Blowout Prevention" and "Kick Control Work Sheet" should be posted at the well.