

Basic Surface Circulating Systems Used in Drilling Wells

Exhibit 22

JANN

Systems Reviewed

- Conventional drilling using an earth reserve pit
- Drilling with “Closed Loop System” no earth reserve pit.

Conventional Circulation

- Components
- Stages of circulation
- Cuttings storage
- Foot print

Components of a Conventional Reserve Pit Circulating System

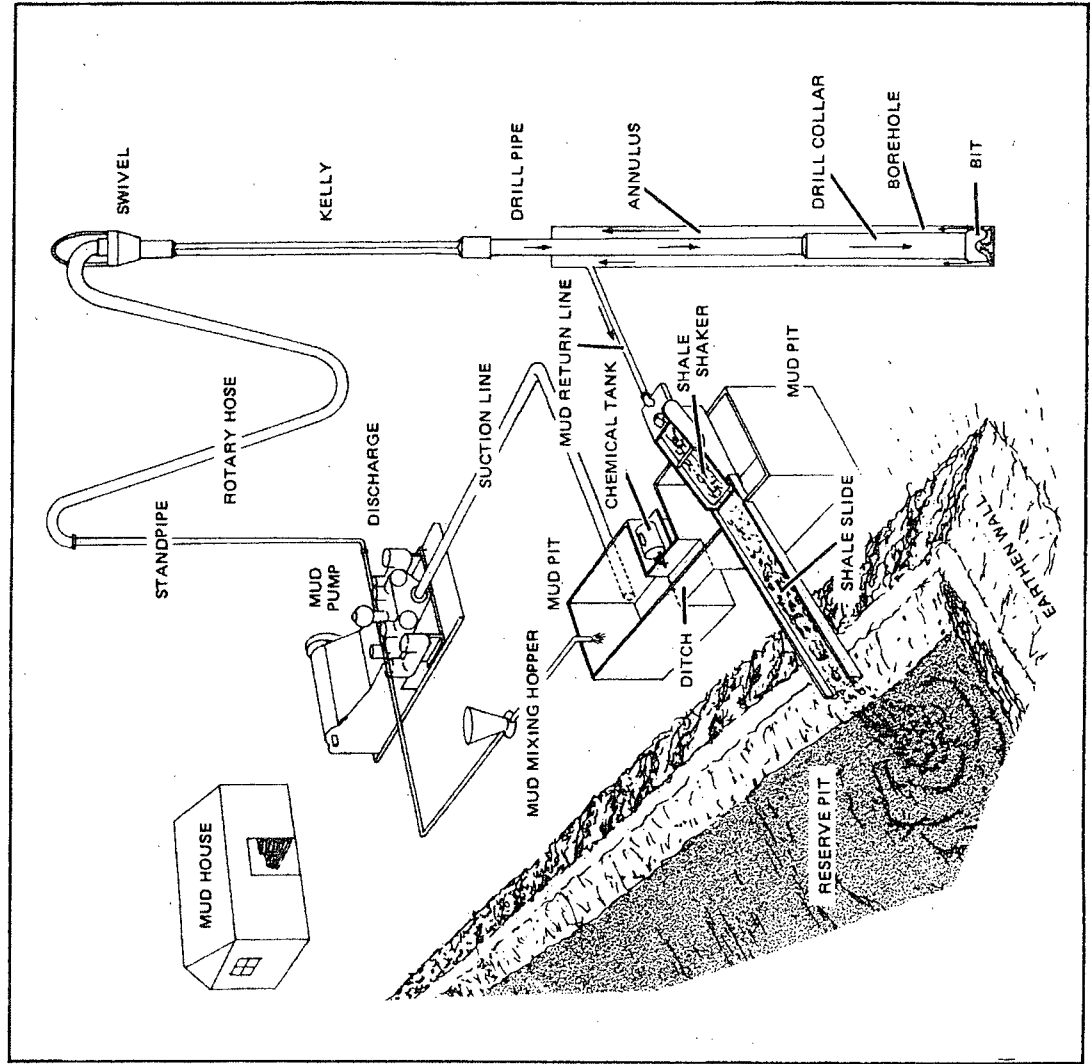


FIGURE 24. ROUTE OF CIRCULATING FLUID

First Stage

Circulation of Reserve Pit

- Top - circulation through reserve pit
- Bottom - circulation through steel pits

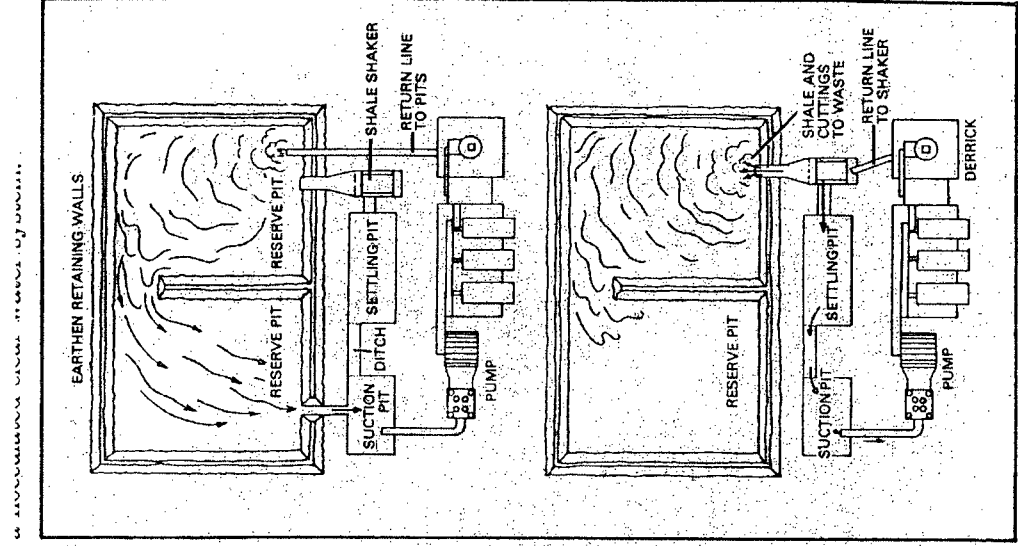
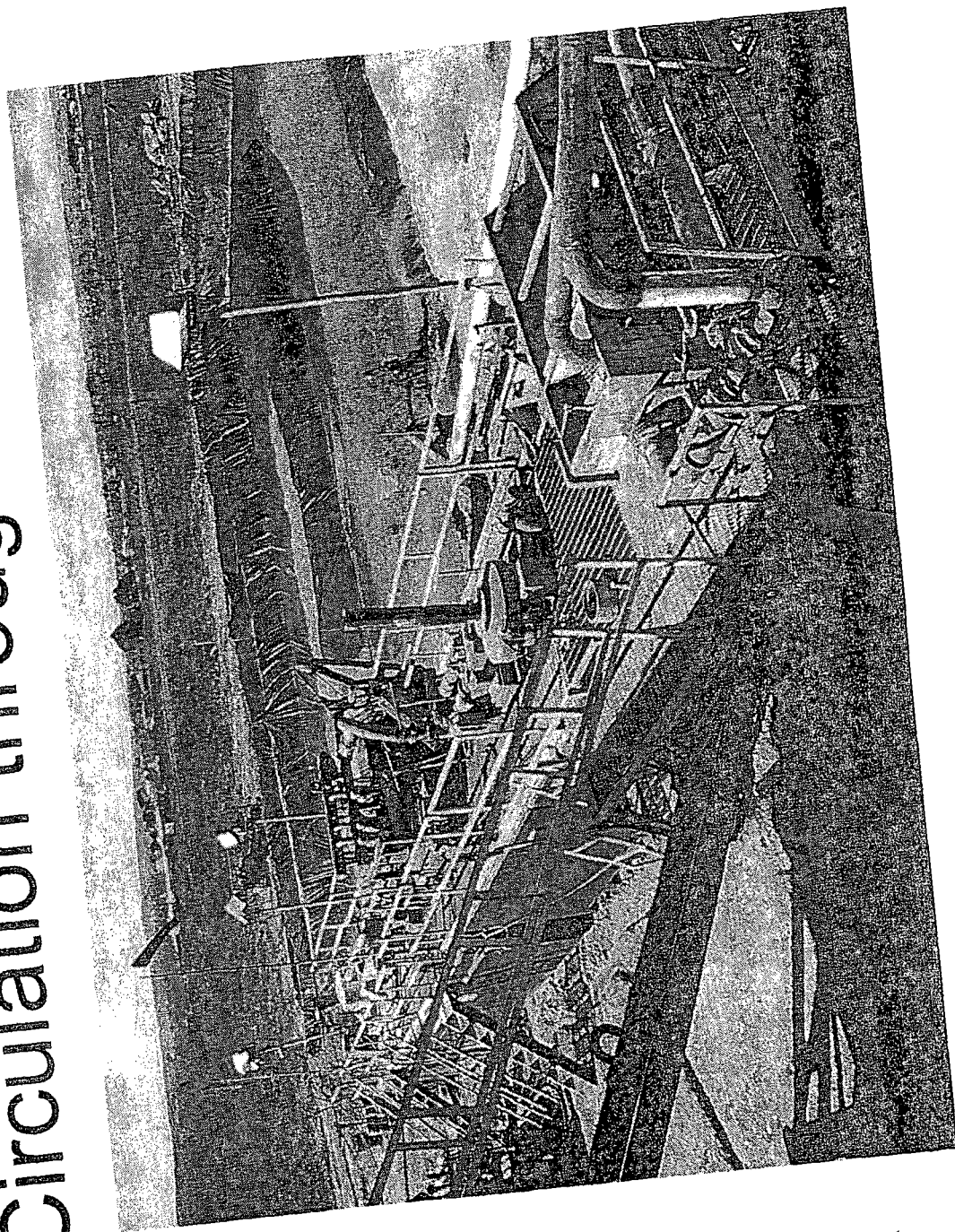


FIGURE 25. EARTHEN PITS FOR FLUID CIRCULATION AND WASTE DISPOSAL

Second Stage Circulation through Steel Pit

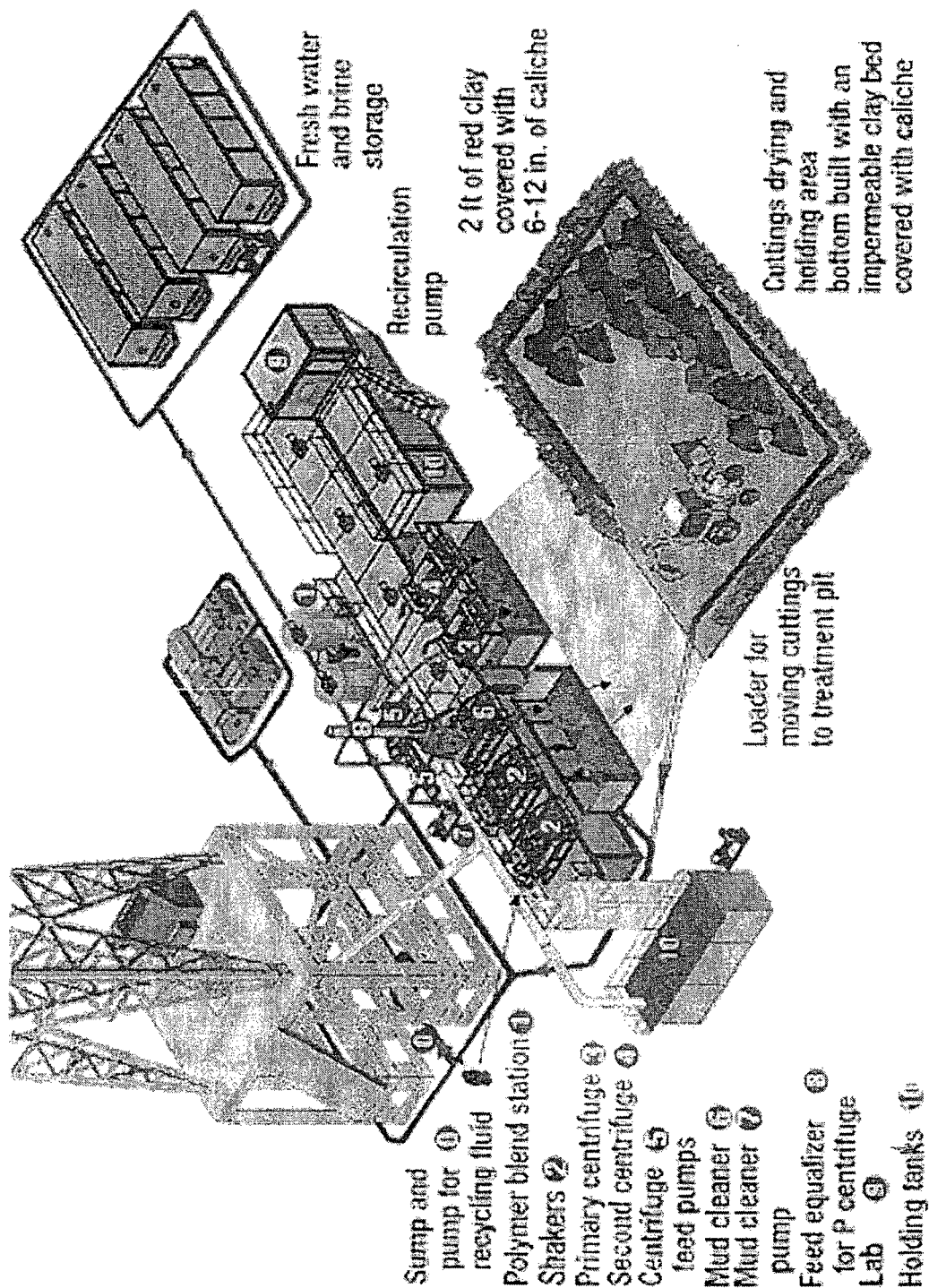


Closed Loop Systems

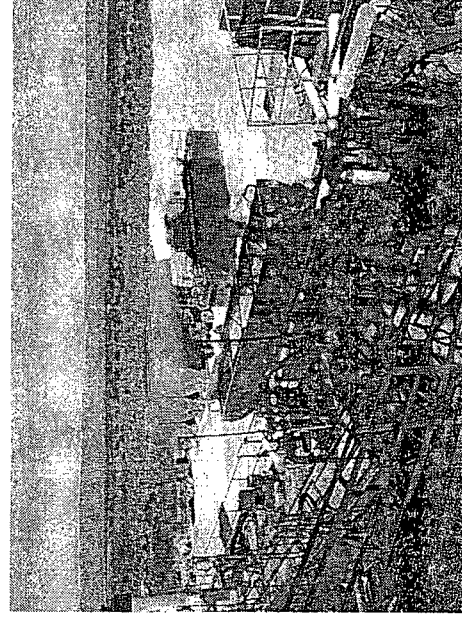
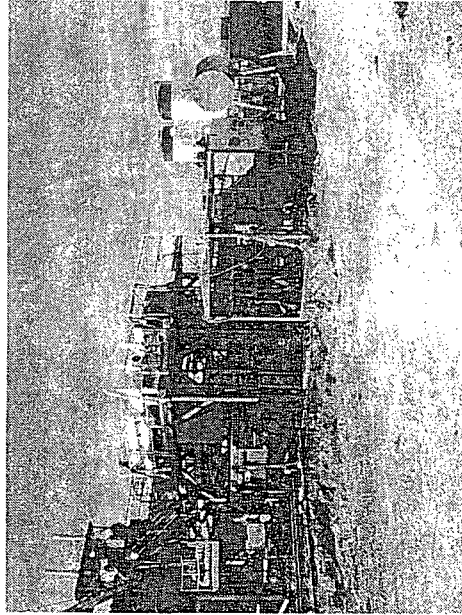
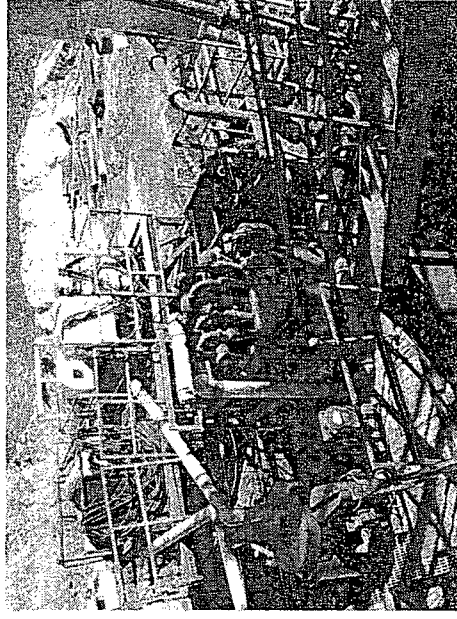
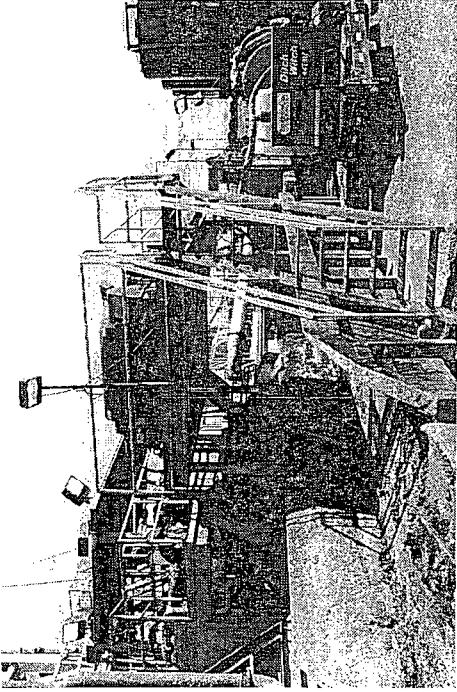
- Components
- Storage of cuttings on location
- Continuous cuttings removal
- Foot print

Components

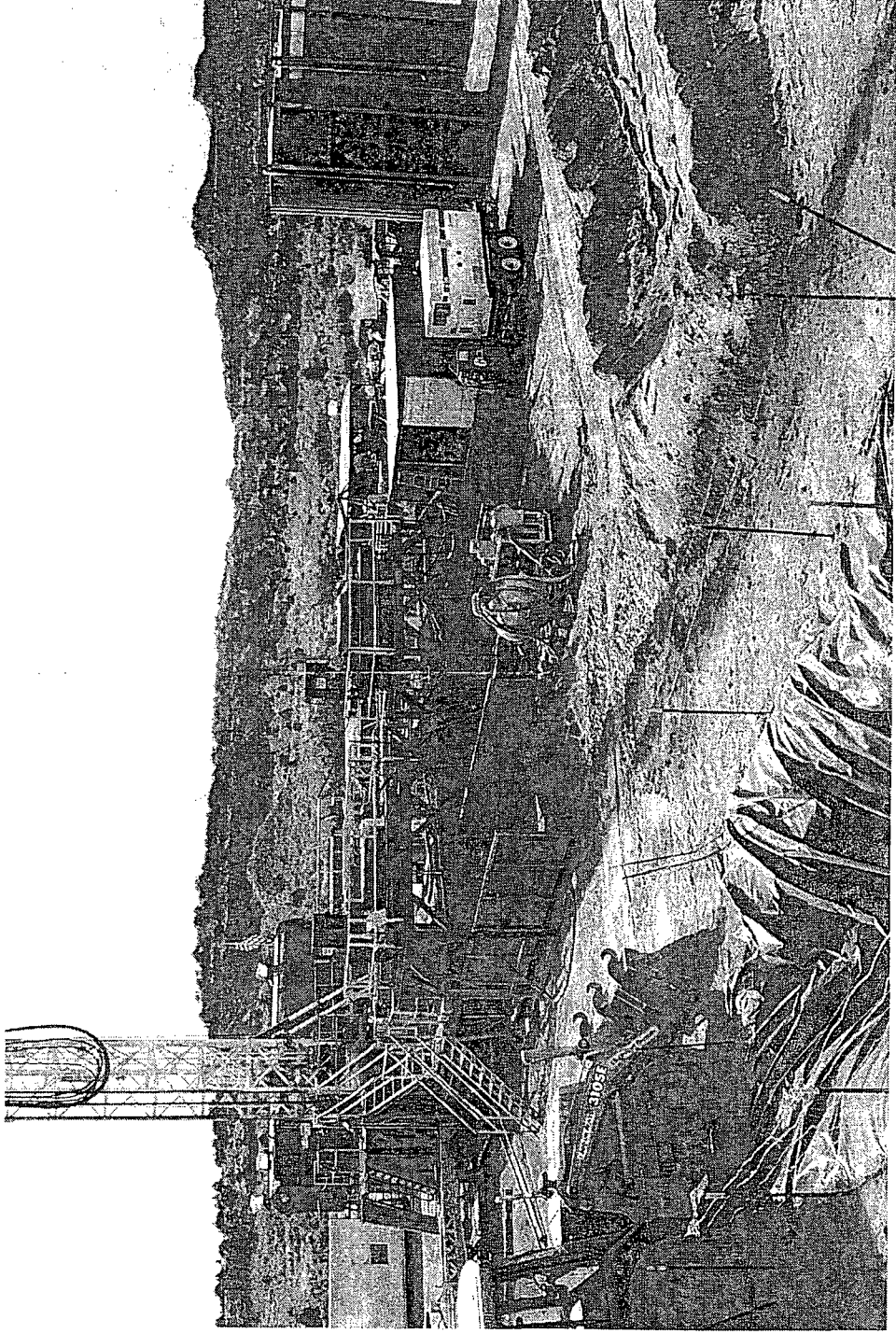
Clip from Cimarex/MI-Swaco World Oil article



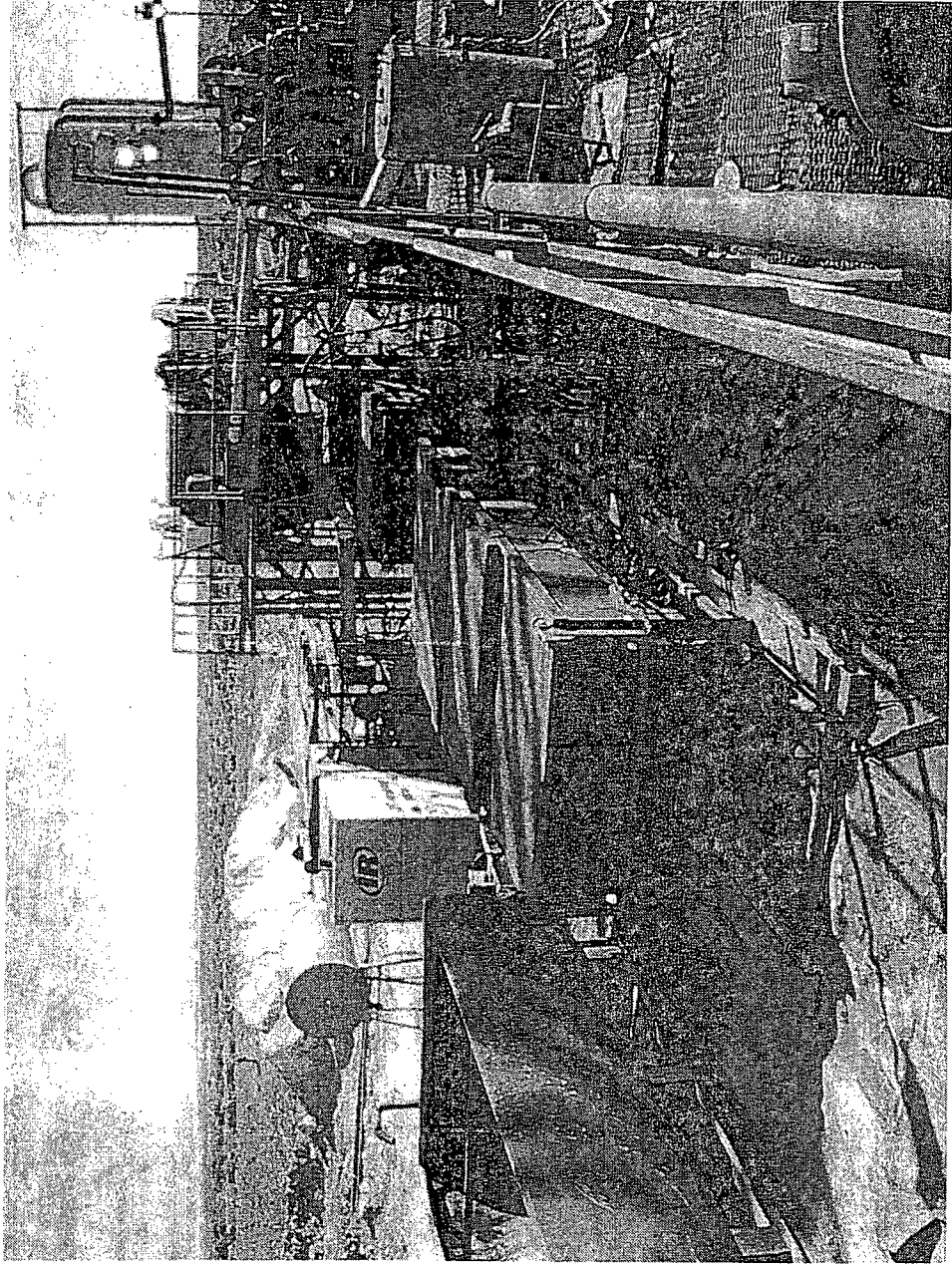
Components



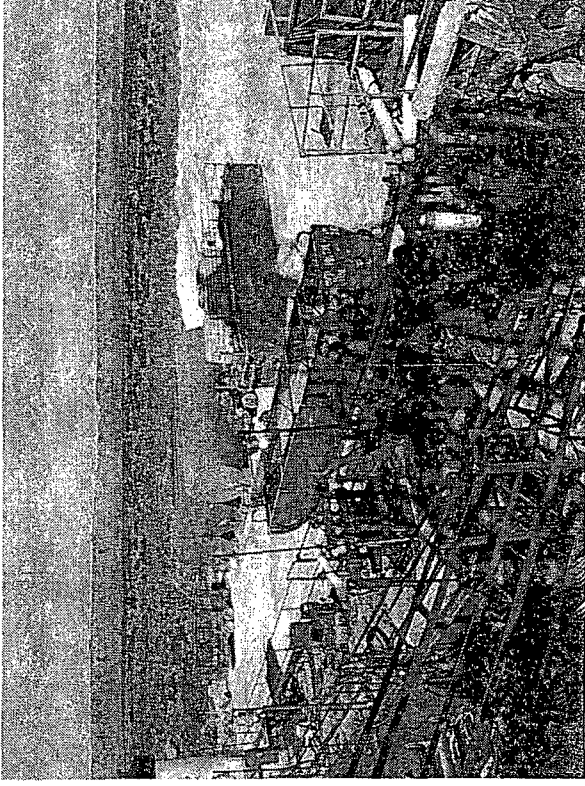
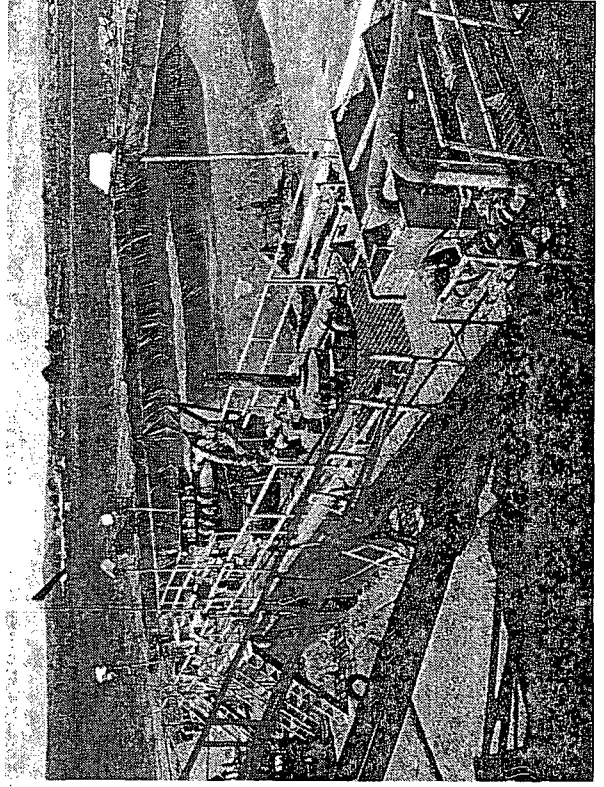
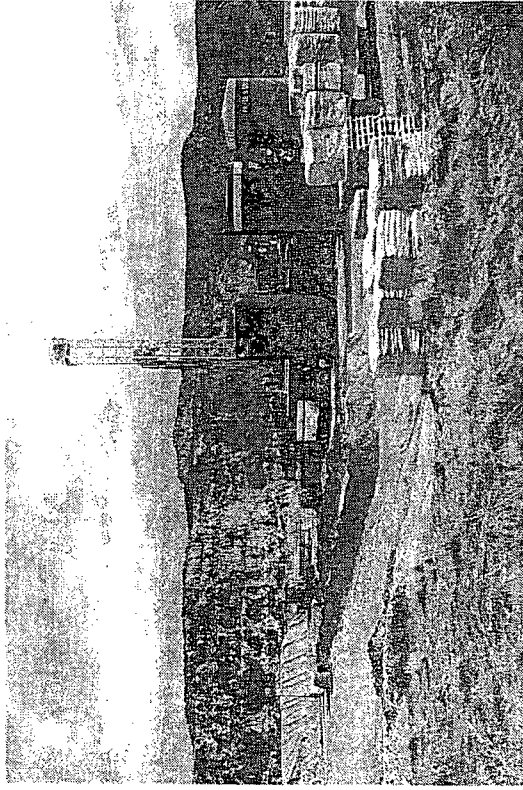
Storage of cuttings on location



Continuous cuttings removal



Foot Print



Foot Print

