The quantity of water encountered was a serious obstacle to the mining in almost every mine that exceeded fifty to seventy-five feet in depth. Cornish pumps were used in almost all the mines, and the water was used in washing the ore.

The mining equipment was never elaborate, because of the character of occurrence of the ore, and the output of any particular mine was consequently small. It is doubtful whether the output of any of the mines averaged more than 35 tons a day, and in most of them the average output was less than half that quantity.

**PREPARATION FOR MARKET**

The large amount of clay invariably associated with the limonite ore necessitated washing most of the ore before it could be shipped to the furnaces. In some mines masses of fairly pure ore were obtained that were practically free from adhering clay, and these were ready for shipment as mined, but this material was exceptional.

In the washing process several modifications of the common log washer were used. In its simplest form this device is merely a log or shaft to which are attached, in a spiral arrangement, iron plates that project a few inches. This log, which can be rotated, is set at an angle and surrounded by a trough, into which the mixture of ore and clay is dumped. Above the trough runs a water pipe or small trough with numerous perforations through which the water passes to mix with the clay and ore. The ore and the associated clay are dumped into the lower part of the trough, and the log is rotated to carry the large particles upward to the end of the trough, where they fall on a platform, while the water carries the clay in suspension to the lower part, where it flows into wooden troughs, usually supported by trestles, that convey it to a settling pond.

If the clay adheres very firmly to the ore it may become necessary to reverse some of the teeth or plates in the log in order to retard the passage of the ore and give them more opportunity to loosen the clay.

In the washing process pieces of chert or other rocks remain with the ore and must be picked out by hand, and many small fragments of ore are washed away by the water.

Most of the mines yielded enough water for washing the ore, but at times some of them had to obtain additional water from wells or near-by streams. In some places the comparatively clear water from the settling ponds was drawn off into another basin and again pumped to the washers.

The daily average of ore handled by a single washer was never large but ranged from 15 to 35 tons.