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CCD-Merrill Crowe for Gold and Silver

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The WesTech **Buoyant Media Clarifier** represents the latest technology in clarification solutions. It contains a floating bed of filter media which acts to clarify the overflow. Overflow clarities of 20 ppm have been achieved in applications where conventional clarifier technology failed to achieve 120 ppm. The buoyant media clarifier produces overflow similar to that of traditional filters, without the high capital and running costs.

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## Countercurrent Displacement (CCD)

Rock passes into a dump hopper and is then transferred to a vibrating grizzly screen. The oversized material is sent to a jaw crusher. The crushed product is combined with the grizzly undersize and the ore is conveyed to the coarse ore bin.

## Grinding

Coarse ore is ground, sized, slurried with pregnant liquor, and pumped to the hydrocyclone cluster. Oversized material from the hydrocyclone cluster underflow is returned to the ball mill for further grinding. The hydrocyclone overflow is sent to a trash screen which rejects oversized material and debris.

## Pre-leach Thickening

The trash screen underflow slurry is fed to the high rate pre-leach thickener. Diluted flocculant and barren solution are added to the feed of the thickener to assist in solids settling and thickening. Thickener underflow is pumped to the leaching circuit. Overflow pregnant solution containing precious metals dissolved into solution is pumped to the clarifier.

## Leaching

Cyanide solution is added to leach the gold from the slurry using a series of mixed leach tanks. Oxygen is injected into first leach tank using a recirculation pump to maintain sufficient dissolved oxygen in the slurry for leaching. Slaked lime slurry is used to increase pulp pH levels.

The countercurrent displacement (CCD) circuit recovers precious metals leached into solution using a multistage countercurrent thickener. Slurry from the leaching process reports to the first CCD thickener. The thickened underflow is pumped to the next CCD thickener where it is washed with recovered solution from the previous CCD thickener. Thickened underflow slurry from the

final CCD thickener is pumped to the tailings paste thickener. The wash solution will flow countercurrent to the solids flow, increasing in precious metal concentration as it proceeds to the first CCD thickener. The pregnant solution from the first CCD thickener is pumped to the buoyant media clarifier.

## Tailings

A high-rate or paste thickener dewateres the tails (waste) before disposal in a tailings pond, or as a paste deposition.

## Merrill-Crowe Precipitation

A buoyant media clarifier provides initial clarification of the solution. Clarifier overflow is pumped to the polishing filter circuit. The remaining suspended solids in the clarified solution are removed by pressure leaf filters. Diatomaceous earth is used to precoat the filters and as a body feed. Filtered pregnant solution is discharged to the vacuum deaeration column which removes oxygen from the solution in a packed tower.

A zinc feeder with an auger is used for the addition of zinc. The zinc powder displaces the gold from solution. A rich pregnant solution allows for better utilization of the zinc.

Final recovery of the precious metals is accomplished by filtering the solution using filter presses. The recessed plate-type filter press collects the filter cake between the filter plates in the chambers formed by the recessed plates. At the end of the filtration cycle, the free liquid is displaced from the filter cake by an air blow step. The filter press is opened and the cake falls from between the plates. It is then collected and sent to the smelter.