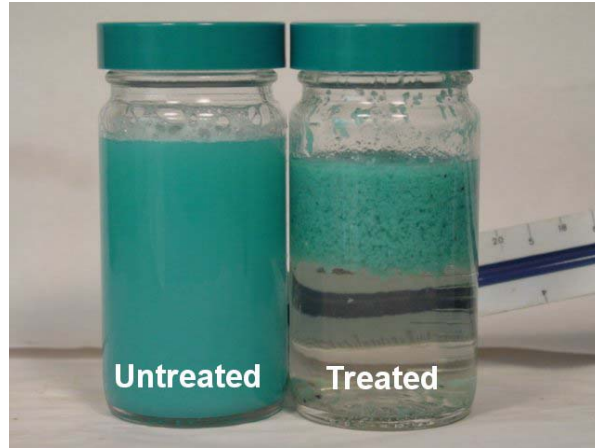




Circuit Board Manufacturer

A circuit board manufacturer in southern California was not able to achieve the discharge levels of copper and nickel with their existing system of coagulant, anionic and cationic flocculants and metal precipitant treatment process followed by lamella plate clarification. The previous treatment process developed a settled sludge that had poor shear characteristics and required further coagulant addition to be able to dewater in the filter press. The facility processes 50,000 gal/day and recycles all but 2,500 gal/day, which is discharged to the Los Angeles County Sanitary Sewer system. Their target was 1.0 ppm and they were achieving 0.5 to 1.5 ppm in a sporadic manner.



Integrated Engineers treated the water with IE-061 (a metal precipitant) to a set point pH of 10.2 and flocced with Floccin D. Samples were analyzed using current EPA methods on an ICP.

Analytical Results

| Component | Untreated | Previous Treatment | Floccin Treatment |
|-----------|-----------|--------------------|-------------------|
| Copper | 156 ppm | 0.5-1.5 ppm | 0.3 ppm |
| Nickel | 210 ppm | 0.6-1.5 ppm | 0.4 ppm |