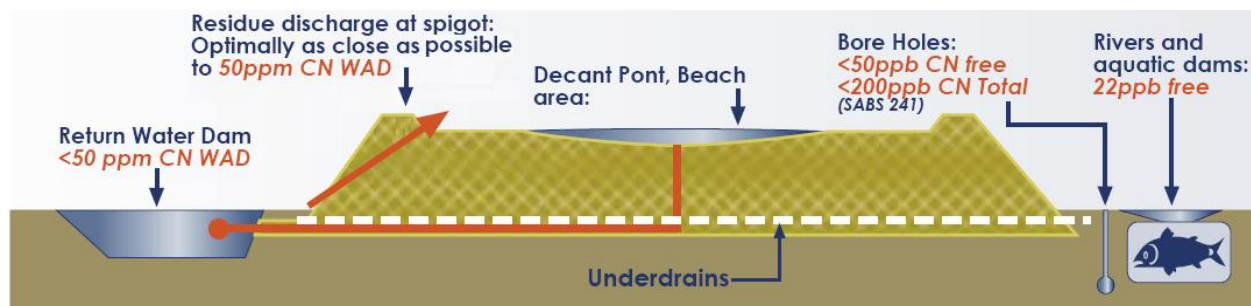


## Hydrometallurgical Process: Analysis of Free, Total & WAD Cyanide in gold leach slurry & wastewater.

Cyanide is mainly produced for the mining of gold, silver and platinum. It helps to dissolve these metals from their ores a process known as cyanidation. This is the chemical leaching step and major part of the CIP/CIL plant circuit and gold recovery process. In order to achieve effective leaching prior to carbon adsorption, cyanide concentrations must be maintained at minimum levels. The on line free cyanide measurement manages the cyanide profile throughout the leach circuit and reduces cyanide consumption without compromising gold recovery. Accurate measurements are relied on for automatic chemical replenishment of the cyanide to the leach tanks and ensures a reduction of cyanide concentration in the mill tailings.

In addition, measurement of WAD Cyanide (weak acid dissociable metal-cyanide complexes) gives an immediate indication of the WAD metals being processed to further optimize the cyanidation process. WAD readings are also an early indication for the detoxification plant to optimize the cyanide destruction process coupled with automatic dosage of the cyanide detoxification chemicals.

Cyanide, in any form, can cause severe damage to the environment therefore strict waste water monitoring for Free Cyanide, WAD Cyanide or TCN is required to meet plant discharge regulations.



*Cyanide concentration limits for wastewater mining facilities*

**Application:** Cyanide can be determined in several ways. Free cyanide is analysed by direct titration or photometric detection depending on concentrations. For the more difficult Total Cyanide and WAD determinations the Process Analyzer ADI 245TI is especially equipped with a combination of digester, condenser, caustic absorber and photometer modules to guarantee full recoveries of cyanide from complex metal cyanide solutions. The time consuming analysis can be completely automated with the on-line Process Analyzer 2045TI. The benefits are time saving and consistency with no exposure to cyanide offering safe and trusted measurements throughout the plant.

**Typical Range:** 0 – 200 µg/L, 1 – 250 mg/L CN<sup>-</sup>. Other ranges possible.

**Remarks:** The total cyanide method is based on ISO 6703/1 and WAD cyanide on method 4500-CN<sup>-</sup> Standard Methods for the Examination of Water and Wastewater.