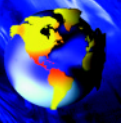




# System Application



SMITH & LOVELESS INC.

[www.smithandloveless.com](http://www.smithandloveless.com)

## S&L Provides Metal Precipitation System For Ammunition Facility



**Application Profile:** East Alton, IL  
**S&L Equipment:** DELTA-G™ & DI-SEP®

The **DELTA-G™**s are unique since they were modified to be physically located in a low overhead area. The flow is 300 GPM, and we used two parallel systems preceded by the chemical treatment system. The **DELTA-G™**s have an automatic sludge blowdown system for sludge filter press dewatering, and the plate packs are removable for maintenance/cleaning. Cleaning occurs with a service water hose.

Smith & Loveless installed a system at an ammunition manufacturing facility that required a metal reduction treatment scheme. Smith & Loveless was contacted to provide a complete system to include Smith & Loveless **DELTA-G™** and **DI-SEP®** pressure filters. The client desired to have a single-source supply and due to the unique physical constraints, Smith & Loveless was able to manage the treatment scheme.

Suspended solid discharge of the **DELTA-G™** ranges from 15 – 30 PPM, and filterable metals is typically below detectable limits. Polishing pressure filters are used prior to effluent discharge.

The consulting engineer appreciated the assistance and refinement of the design from Smith & Loveless. The treatment system precipitates copper, cadmium, lead and hexavalent chrome. The hexavalent chrome is first reduced to trivalent chrome prior to blending with the other waste streams to conserve chemicals.

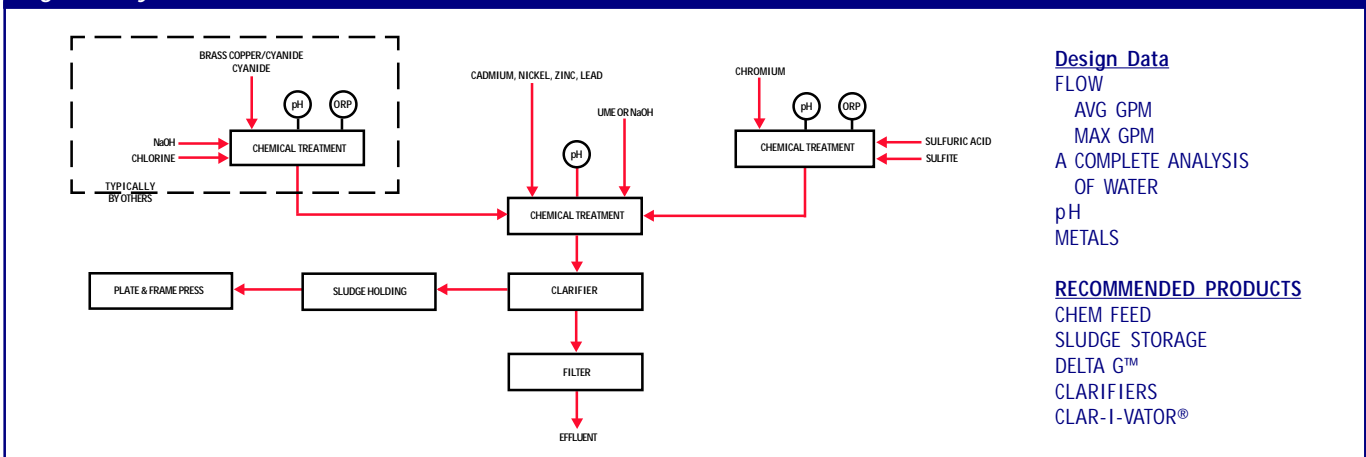
**DI-SEP®** supplied the dual; multimedia pressure filters which alternate in operation. A pump suction well is level, controlled and monitored to control the pressurization pump to the filters. This maintains a consistent pressure on the filter bed to prevent channeling.

The original design by the consulting engineer used inline static mixers for wasting the soluble metals solution with either caustic or hydrated lime prior to entering the **DELTA-G™**s. Smith & Loveless recommended pH control and 15-minute retention time for complete metal oxidation, followed by a slow mix anionic polymer re-aeration zone for coagulation. This system proved to be more efficient and effective than the inline static mixers.

The filters use clean water for backwash, and plant air for air scour. Backwash is automatic by use of reliable differential pressure meters.

Effluent from the complete treatment system is pristine in color, and final pH adjusted to 7.0 – 7.5 using sulfuric acid. The purpose for the final pH adjustment is this stream combines with other streams, organic, for biological treatment prior to NPDES discharge.

Figure 1: System Flow Scheme



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