

**Alliant TechSystems**  
**Twin Cities Army Ammunition Plant**  
**BLD 502 Water Treatment Project**  
August, 1998

Water and sediments contaminated with depleted uranium, a radioactive heavy metal, oils, soaps and other residues were pumped from a holding sump in BLD 502 at the site located in New Brighton, MN. The waste water and sediment were treated with META-LOCK™. The waste stream consisted of water and sediments containing a fine powdered talc-like material with moderate amounts of organic matter. The overall water quality was very poor, resembling a used oil product rather than water. The water and sediments contained high levels, 2330 ppm of depleted uranium, well in excess of release limits.

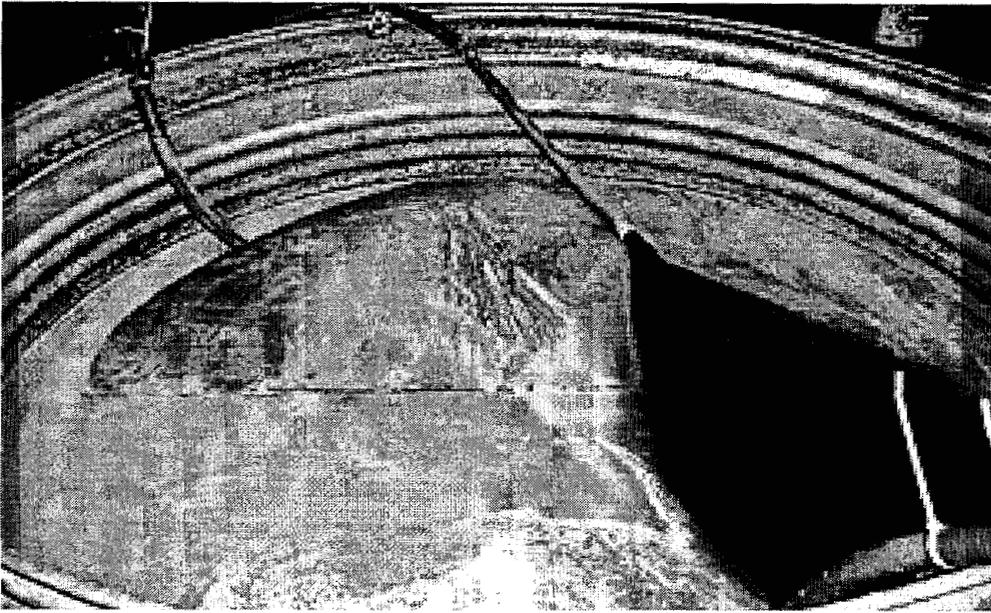
The waste water was pumped into a batch sized mixing tank and treated with META-LOCK™ at a predetermined application rate of 0.5% to 0.75%. The waste water was then re-circulated and allowed to phase separate. After phase separation the supernate was pumped through a 0.5-micron filter to a sampling tank where the contents were re-circulated and sampled. The samples were then subjected to on site wet chemistry by ICP and off-site gamma spectroscopy to determine the effects of the treatment process. A total of ten batches were processed and sampled.

Sample results from the first batch were sent to the St. Paul Metropolitan Council Environmental Services and approval was given to discharge the treated waste water to the sites waste water treatment plant as long as subsequent results showed no detectable depleted uranium activity. All subsequent sample results showed no detectable depleted uranium activity.

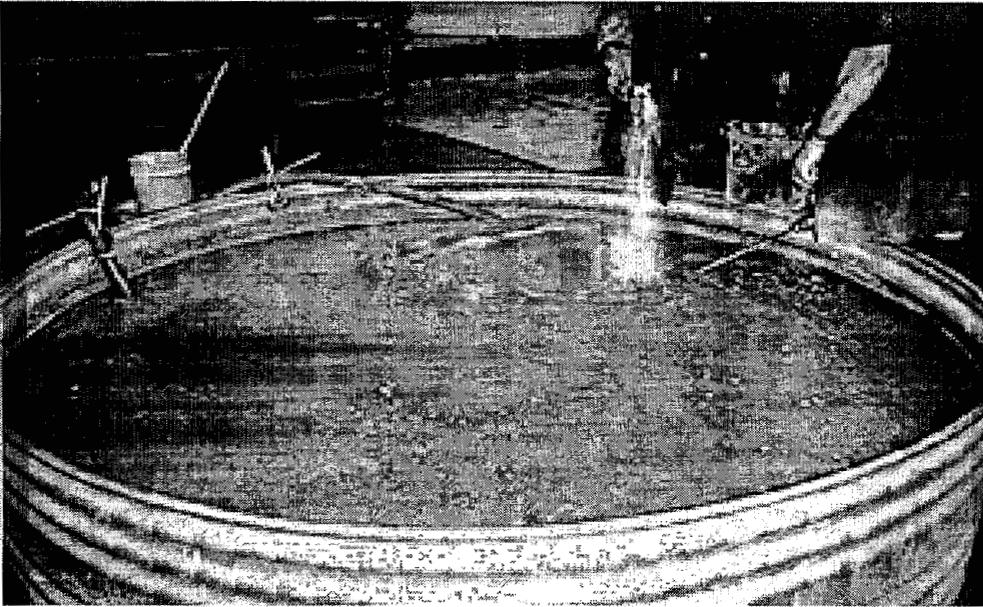
A total of 10 batches of water, 4,400 gallons, were discharged to the site's waste water treatment plant. A total of only 1.5 cubic feet of dried sludge was generated from the process. The sludges will be disposed of as radioactive waste during subsequent D&D activities.

Water clarity went from a viscous black to clear water (*view photographs below*). The META-LOCK™ process oxidized the hydrocarbons. The entire process was very easy to control, with pH being the primary process control parameter. We found that even the < 0.5-micron size particles that passed through the filter fell out of solution after treatment and were easily captured. The META-LOCK™ process proved to be an extremely effective method to deal with this very difficult waste stream.

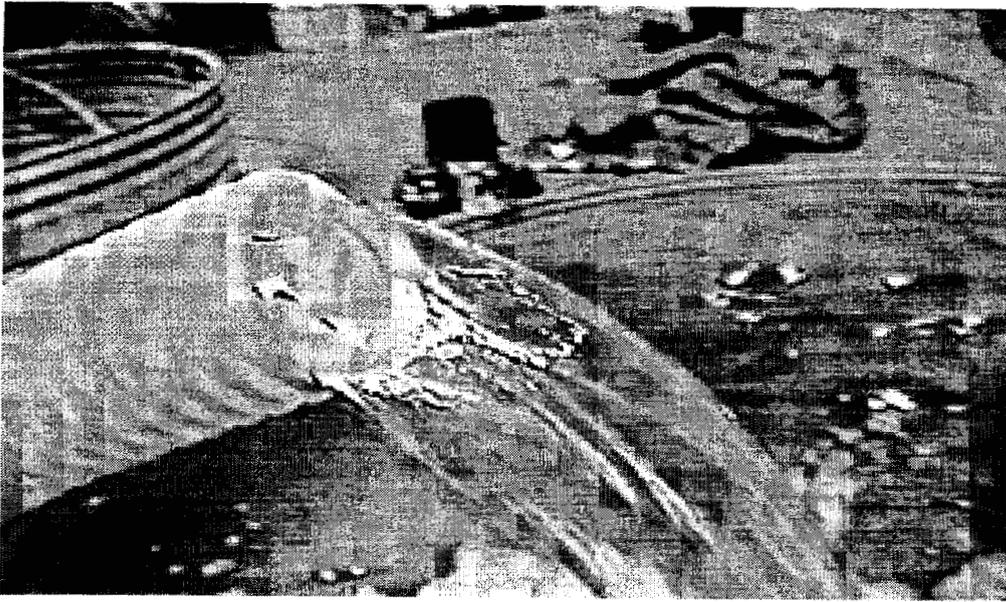
*Radioactive sump waters containing high levels (2330) of depleted uranium, oils, soaps, and other residues are being pumped into the mixing tank for treatment.*



*META-LOCK™ powder is blended into the water causing flocculation and precipitation of the radioactive isotopes and other heavy metals.*



*Clean, radioactive-free water can be discharged leaving only a small amount of sediment. Over 99% volume reduction was achieved on these waters.*



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