

**A Bioprocess for the Removal of Heavy Metals and Other Inorganics from Various Waters**

Brad Wahlquist, Applied Biosciences Corporation, 265 Crossroads Square, Salt Lake City, UT 84115 Email: [bwahlquist@applied-biosciences.com](mailto:bwahlquist@applied-biosciences.com)

Tim Pickett, Applied Biosciences Corporation, 265 Crossroads Square, Salt Lake City, UT 84115 Email: [tpickett@applied-biosciences.com](mailto:tpickett@applied-biosciences.com)

D. Jack Adams, Applied Biosciences Corporation, 265 Crossroads Square, Salt Lake City, UT 84115 Email: [djadams@applied-biosciences.com](mailto:djadams@applied-biosciences.com)

Applied Biosciences has developed the ABMet™ microbial bioprocess for the removal of metals and inorganics from industrial and other waters. The ABMet™ process uses short retention times and siteoptimized microbial cultures and nutrient blends and has demonstrated removal of As, Se, Cu, Ni, Zn, Hg, Cd, Cr, Te, NO3, CN, and NH3. These bioprocesses can be implemented in pump and treat and semipassive systems. Biological processes result in 1,000 to 10,000 times less sludge than conventional chemical treatments. Current biological treatment systems range from 2 gal/min to 30 gal/min at pilot scale to over 300 gal/min at full scale. Larger treatment systems are also practical – treatment systems up to 10 million gal/day are currently under evaluation. Bioprocess retention times depend on contaminant levels and water chemistry, but range in time from 4 to 24 hours for contaminant removal to below detection. The ABMet™ bioprocess uses low-cost, balanced nutrients that range in cost from \$0.12 to \$0.52 per 1,000 gallons treated, at full-scale. These metal and inorganic removal bioprocess technologies have been validated through various pilot and full-scale implementations and through the EPA's Mine Waste Technology Program. Case studies present quantity and quality of water treated, reagents used, minimal pretreatment requirements, water quality inputs, discharge water quality, process costs, and process benefits.

University of Massachusetts - Amherst  
ScholarWorks@UMass Amherst  
Annual Conference on Soils, Sediments and Water: Abstracts  
10-20-2003  
The 19th Annual International Conference on Soils, Sediments and Water

This Abstract Book is brought to you for free and open access by ScholarWorks@UMass Amherst. It has been accepted for inclusion in Annual Conference on Soils, Sediments and Water: Abstracts by an authorized administrator of ScholarWorks@UMass Amherst. For more information, please contact [scholarworks@library.umass.edu](mailto:scholarworks@library.umass.edu).

"The 19th Annual International Conference on Soils, Sediments and Water" (2003).  
Annual Conference on Soils, Sediments and Water: Abstracts. Paper 2.

[http://scholarworks.umass.edu/soils\\_conf\\_abstracts/2Conference](http://scholarworks.umass.edu/soils_conf_abstracts/2Conference) Co-Direct

A Bioprocess for the Removal of Heavy Metals and Other Inorganics from Various Waters Brad Wahlquist, Applied Biosciences Corporation, 265 Crossroads Square, Salt Lake City, UT 84115 Email: [bwahlquist@applied-biosciences.com](mailto:bwahlquist@applied-biosciences.com)

Tim Pickett, Applied Biosciences Corporation, 265 Crossroads Square, Salt Lake City, UT 84115 Email: [tpickett@applied-biosciences.com](mailto:tpickett@applied-biosciences.com)

D. Jack Adams, Applied Biosciences Corporation, 265 Crossroads Square, Salt Lake City, UT 84115 Email: [djadams@applied-biosciences.com](mailto:djadams@applied-biosciences.com)

Applied Biosciences has developed the ABMet™ microbial bioprocess for the removal of metals and inorganics from industrial and other waters. The ABMet™ process uses short retention times and siteoptimized microbial cultures and nutrient blends and has demonstrated removal of As, Se, Cu, Ni, Zn, Hg, Cd, Cr, Te, NO<sub>3</sub>, CN, and NH<sub>3</sub>. These bioprocesses can be implemented in pump and treat and semipassive systems. Biological processes result in 1,000 to 10,000 times less sludge than conventional chemical treatments. Current biological treatment systems range from 2 gal/min to 30 gal/min at pilot scale to over 300 gal/min at full scale. Larger treatment systems are also practical – treatment systems up to 10 million gal/day are currently under evaluation. Bioprocess retention times depend on contaminant levels and water chemistry, but range in time from 4 to 24 hours for contaminant removal to below detection. The ABMet™ bioprocess uses low-cost, balanced nutrients that range in cost from \$0.12 to \$0.52 per 1,000 gallons treated, at full-scale. These metal and inorganic removal bioprocess technologies have been validated through various pilot and full-scale implementations and through the EPA's Mine Waste Technology Program. Case studies present quantity and quality of water treated, reagents used, minimal pretreatment requirements, water quality inputs, discharge water quality, process costs, and process benefits.

University of Massachusetts - Amherst

ScholarWorks@UMass Amherst

Annual Conference on Soils, Sediments and Water: Abstracts

10-20-2003

The 19th Annual International Conference on Soils, Sediments and Water

This Abstract Book is brought to you for free and open access by ScholarWorks@UMass Amherst. It has been accepted for inclusion in Annual Conference on Soils, Sediments and Water: Abstracts by an authorized administrator of ScholarWorks@UMass Amherst. For more information, please contact [scholarworks@library.umass.edu](mailto:scholarworks@library.umass.edu).

"The 19th Annual International Conference on Soils, Sediments and Water" (2003). Annual Conference on Soils, Sediments and Water:

Abstracts. Paper 2.

[http://scholarworks.umass.edu/soils\\_conf\\_abstracts/2Conference](http://scholarworks.umass.edu/soils_conf_abstracts/2Conference) Co-Direct