**Short Courses**

Short courses run from 8:30 a.m. to 4:30 p.m. Cost is $95 per course. Lunch is provided.

**Sunday, April 25, 2004:**

**Caps & Covers for Mine Waste**

Presenter:
- Craig Benson, Ph.D., P.E., University of Wisconsin-Madison

This course will cover the essential aspects associated with design and construction of caps and covers for closure of tailings facilities, waste rock piles, and other mine waste containment facilities. The discussion will include selection of the appropriate type of cap, laboratory and field testing methods, and design calculations. Field data will be used to illustrate the performance of caps and to illustrate principles. Topics to be covered include:

- Types of Caps and Performance Criteria
- Design of Conventional Covers with Resistive Barriers (compacted clay, geomembranes, geosynthetic clay liners)
- Design of Alternative Covers (aka Evapotranspiration Caps, Store-and-Release Caps)
- Laboratory and Field Testing Methods
- Estimating Hydraulic Properties and Diffusion Coefficients
- Oxygen Transport Calculations

Recent field data from US EPA’s Alternative Cover Assessment Program will be presented that illustrate the effectiveness of various cap designs in different climates.

**Monday, April 26, 2004:**

**Mine Discharge Water Treatment**

Presenters:
- Glenn Miller, Ph.D., University of Nevada, Reno
- Mike Wireman, US EPA

Water released from mine sites can contain a variety of constituents that have the potential to degrade surface and groundwater. Acidic drainage is the most serious and common water quality problem, although neutral or alkaline drainage containing arsenic, selenium, cyanide or sulfate is also observed. Water treatment methods need to be both robust and cost effective. Options for treatment vary, depending on the type of contamination, as well as the regulatory requirements. This workshop will review current biological and chemical methods for mine water treatment, with a focus on treatment effectiveness and cost.

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**Twelfth Annual**

**Mine Design, Operations & Closure Conference 2004**

**April 25—29, 2004**

KwaTaqNuk Resort
Polson, Montana

**Sponsors**

- USDA Forest Service
- Bureau of Land Management
- Montana Department of Environmental Quality
- Montana Tech of The University of Montana
- Mine Waste Technology Program
- U.S. Department of Energy National Energy Technology Laboratory
- U.S. EPA Office of Research & Development
- MSE Technology Applications, Inc.
- Rocky Mountain Regional Hazardous Substance Research Center
- Spectrum Engineering, Inc.
- ARCO Environmental Remediation
- Bitterroot Restoration
- Pioneer Technical Services
- Luzenac America (Yellowstone Mine)
- Golden Sunlight Mine
- Maxim Technologies, Inc.
- ACZ Laboratories, Inc.
- CDM—Helena, Montana
- Revett Silver Company

We appreciate your support!
**General Session Agenda**

**Tuesday, April 27, 2004**

7:00 a.m. Registration

8:00 – 8:30 a.m. Keynote

- Mike Burnside, US Forest Service

**Mine Operations Session**

8:30 – 9:00 a.m. Rock Creek

- Dave Gaskin, Nevada Division of Environmental Protection

9:00 – 9:30 a.m. Rock Creek

- Shannon Dunlap, Golden Sunlight

9:30 – 10:00 a.m. Rock Creek

- Larry Gore, US Forest Service

10:00 – 10:30 a.m. Break

**Bioremediation Session**

10:30 – 11:00 a.m. Spectrum at Zortman

- Mike Masch, Spectrum Engineering, Inc.

11:00 – 11:30 a.m. Zortman

- Bill Maehl, Spectrum Engineering, Inc.

11:30 – Noon Montana

- Shannon Dunlap, Golden Sunlight

Noon – 1:00 p.m. Lunch

**Bonding Session**

1:00 – 1:30 p.m. Montana

- Darrel Stordahl, CDM

1:30 – 2:00 p.m. Montana

- Jim Kuipers, J. Kuipers Engineering

2:00 – 2:30 p.m. Montana

- Larry Gore, US Forest Service

2:30 – 3:00 p.m. Montana

- Larry Gore, US Forest Service

3:00 – 3:30 p.m. Montana

- Larry Gore, US Forest Service

3:30 – 4:00 p.m. Montana

- Larry Gore, US Forest Service

4:00 – 5:30 p.m. Montana

- Larry Gore, US Forest Service

5:30 – 6:00 p.m. Montana

- Larry Gore, US Forest Service

**Transportation Information**

Air service is available to:

- Missoula International Airport (406) 549-6001
- Kalispell Glacier International Airport (406) 257-5090

Both airports are located approximately 60 miles from Polson.

**Wednesday, April 28, 2004**

**Pitlake Overview Session**

8:00 – 8:30 a.m. Implementation Perspectives on the Anchor Hill Pit ARD Remediation

- Ken Wangerud, US EPA

8:30 – 9:00 a.m. Status of Anchor Hill Pit Lake In-situ Treatment, Gilt Edge Mine Superfund Site, South Dakota, USA

- Brian Park, MSE Technology Applications, Inc.

9:00 – 9:30 a.m. Ecosystem Restoration at Sweetwater & Equatorial Pitlakes

- Joseph Harrington, ARCADIS

9:30 – 10:00 a.m. Steeple Gold & Golden Cross Mines

- Geoff Beale, Water Mgmt. Consultants

10:00 – 10:30 a.m. Break

**Pitlake Closure Session**

11:00 – 11:20 a.m. Montana

- Warren McCullough, Montana DEQ

11:20 – 11:40 a.m. Montana

- Dave Gaskin, Nevada Division of Environmental Protection

11:40 a.m.–Noon Montana

- Victor Izzo, CA Water Quality Board

Noon – 12:30 p.m. Montana

- Pitlake Closure Question/Answer Lunch

12:30 – 1:30 p.m. Montana

- Joel Chavez, Montana DEQ

**Backfilling Session**

1:30 – 1:50 p.m. MAA for Pit Backfilling

- Andy Robertson, Robertson GeoConsultants

1:50 – 2:10 p.m. Pit Backfilling: Options in an Arid Environment

- Glenn Miller, Univ. of Nevada, Reno

2:10 – 2:30 p.m. Pit Backfilling: Options in an Arid Environment

- Jim Jonas, CDM

2:30 – 2:50 p.m. Pit Backfilling: Options in an Arid Environment

- Mike Burnside

2:50 – 3:10 p.m. Pit Backfilling: Options in an Arid Environment

- Anne Maest, Buka Environmental

3:10 – 3:30 p.m. Pit Backfilling: Options in an Arid Environment

- Jim Jonas, CDM

3:30 – 4:00 p.m. Pit Backfilling: Options in an Arid Environment

- Carol Russell, US EPA

**Panel Session**

4:00 – 5:30 p.m. Montana

- Moderator: Mike Burnside

**Accommodations**

The Best Western KwaTaqNuk Resort in Polson, Montana, is the host resort for this year’s event. Rooms are also available at the Port Polson Inn (located across the street from the KwaTaqNuk Resort). Please mention the Mine Design, Operations & Closure Conference when making reservations.

KwaTaqNuk Resort

303 US Hwy. 93 E

Polson, Montana (406) 257-5090

Rates: $$$

Port Polson Inn

US Hwy. 93 E

Polson, Montana (406) 549-6001

Rates: $-

Both resorts are located approximately 60 miles from Polson.

**Thursday, April 29, 2004**

**Zortman/Landusky Reclamation Session**

Reclamation Progress at Zortman/Landusky, Phillips Co., MT

8:00 – 8:30 a.m. Scott Haight, Bureau of Land Mgmt.

8:30 – 9:00 a.m. Wayne Jepson, Montana DEQ

9:00 – 9:30 a.m. Dean Stiffarm, Fort Belknap

9:30 – 10:00 a.m. Break

**Mining Research & Reclamation Session**

10:10 – 10:30 a.m. Investigation of the Effectiveness of Mine Waste Covers in the Helena National Forest

- Rich McNeary & Matt Haas, MT Tech

10:30 – 11:00 a.m. New World Project: McLaren Pit

- Bill Bucher, Maxim Technologies

- Frank Ehernberger, US Forest Service

**General Session**

11:00 – 11:30 a.m. SRB Sulfide Precipitation at Golden Sunlight Mine

- Jim Pompy, Office of Mine Reclamation

- Garrett James, MSE Technology Applications, Inc.

11:30 a.m.– Noon Molecular Characterization of Microbial Communities Present in Sulfate-Reducing Permeable Reactive Zones Remediating Heavy Metals

- Amy Pruden, CO State University

1:00 – 1:30 p.m. Guaranteed Remediation Program Panel: Implications for State and Federal

- Dan Ferriter, ARCO

- Jim Christiansen, US EPA

- Bill Bucher, Maxim Technologies

1:30 – 2:00 p.m. Guaranteed Remediation Program Panel: Implications for State and Federal

- Bruce Gilbert, Stiltwater Mining Co.

- Joel Chavez, Montana DEQ

2:00 – 2:30 p.m. Guaranteed Remediation Program Panel: Implications for State and Federal

- Don Ferriter, ARCO

- Jim Christiansen, US EPA

2:30 – 3:00 p.m. Guaranteed Remediation Program Panel: Implications for State and Federal

- Jim Kuipers, J. Kuipers Engineering

3:00 – 3:30 p.m. Guaranteed Remediation Program Panel: Implications for State and Federal

- Darrel Stordahl, CDM

3:30 – 4:00 p.m. Guaranteed Remediation Program Panel: Implications for State and Federal

- Paul Newman, ARCADIS

4:00 – 4:30 p.m. Guaranteed Remediation Program Panel: Implications for State and Federal

- Mike Burnside

4:30 – 5:00 p.m. Guaranteed Remediation Program Panel: Implications for State and Federal

- Mike Burnside

5:00 – 6:00 p.m. Guaranteed Remediation Program Panel: Implications for State and Federal

- Mike Burnside