

US – India Coal Working Group



*Steep Slope Mining, &
Overburden Dump Stability*

Mike Mosser

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National Energy Technology Laboratory



Steep Seam Coal Mining

- **U.S. Activities on Steep Seams**
 - **Underground Extraction**
 - **A few US mines are competitive working 15 - 18% grades, both CM and LW Units**
 - **Mines located in Maryland, Alabama, Wyoming and Colorado**
 - **Equipment designs enhancements, braking for rolling equipment, increased horse power conveyors with braking, diesel haulage is very beneficial for supplies.**
 - **Excellent Maintenance Program needed to support Production demands**
 - **Trained supervisors and qualified miners**



Steep Seam Underground Mining

- **Economics prohibit mining steep seams currently in U.S.**
- **Production is inherently low**
- **Cost is extremely high**
- **Greater safety risk with existing technology**
- **Specialized equipment is more capital intensive**
- **Maintenance is of greater importance to meet production goals**



Mettiki Coal, LLC

- **Mettiki Coal, LLC. operates a drift mine which enters the outcrop of the 8 1/2 foot Freeport coal seam and dips down starting at a 25% grade towards the Potomac River. Present working sections of the mine are between 2 to 2.5 miles from the mine entrance with an average depth of cover of 600 feet. Over 5 miles of conveyor beltlines transport the raw coal from underground to the surface where the preparation plant cleans the coal of impurities. There are 2 – Continuous Miner Unit and 1 - Longwall**



Steep Seam Coal Mining

- **U.S. Activities on Steep Seams**
 - Surface Mining
 - **Dip-Line Mining Method**
 - Overburden operation, design to handle waste one time.
 - **Engineered haul road and Highwall design**
 - Haul Roads must be well constructed with designed water drainage applied. (haul road is life line of the surface mine)
 - High walls must be properly benched and maintained to avoid slips that interrupt production and cause safety concerns



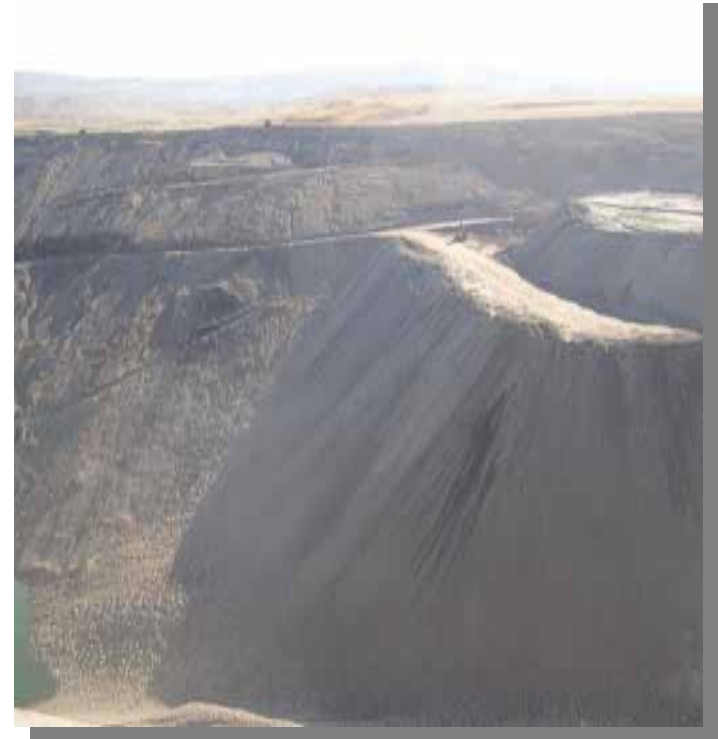
Steep Seam Coal Mining

- **Planning, planning, and more planning.....Mine plan should have balance blending of strip ratios and dip development....looking as much as 20 to 30 years out**
- **Sufficient strike length of seam needs to be extracted to afford efficient haul road ramp development into the pits**
- **Maintenance on equipment needs to be scheduled for the most operating uptime for production**
- **Education and training for equipment operators and supervisors**
- **Spoil of waste rock should be planed to dump once**
- **Sufficient operational area in coal pit to operate needs to be established and maintained for safety and efficiency**



Overburden Slope Stability

- **Develop Bench**
 - Design proper width and slope per your overburden make up
 - Overburden shouldn't be placed where it has to be moved again
 - Dumping into old mine pits to reclaim the mine site to original approximate contour is the ideal reclamation plan



Lignite Mining

- **Mining Method**

- Freedom Mine is the largest lignite mine in the United States, operating two 120-cubic-yard draglines and a fleet of 200-ton overburden trucks
- Savage Mine opened in 1958. It produces 250,000 tons of lignite annually
- Lignite mining is not totally without risk. As lignite mines are excavated, there is some risk that the pit's tall, sloped earthen walls could collapse after a heavy rain. However, such incidents are extremely rare, in part because the industry has developed constant monitoring systems to alert managers when weather might be affecting mining conditions







Thank You

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