

Mining Technology

From Perception to Procedures



MORGAN WORLDWIDE
MINING CONSULTANTS

Introduction



- What is typical environmentalist
 - Target Practice
- Reason for presentation
 - To make sure that environmental issues are included in thought process
 - Environmental awareness not permit compliance
 - No NOV's does not a perfect mine make
- Right of mining
 - Legal land use
 - Critical part of economy and vital commodity

Why Opposition?



- Helplessness
- Feelings of Impotence
- Excluded from Process
- Dislike of change
- Fundamental beliefs

Participants in Process



- Stakeholders
 - Company
 - Industry Groups
 - Industry attorneys
 - Shareholder
 - Landowner
 - Mineral Owner
 - Employees
 - Customer
 - Regulator
 - Community
 - Environment

Industry Character



- Character of industry changing
 - Consolidation of industry
 - Less local involvement
 - Managers are mobile
 - Foreign ownership
- 1998 W.Va Tonnage 160 million tons
- Approx W.Va Value \$3.2 bn

Capability of Industry



- Access to capital
- Capability of constructing almost any configuration
- Very efficient movers of rock
- Ongoing operations and therefore momentum
- Complacency of acceptability of historic approach
- Focus on efficiency

Environmental / Citizen Character



- National issues / groups
- Political groups i.e. Green Party in Germany
- Presidential / National politics
- Local residents
- Troublemaking attorneys

Regulators

- Federal
 - U.S. EPA
 - U.S. Army Corps of Engineers
 - U.S. Fish and Wildlife
 - U.S. OSM
- State
 - WV DEP

Effects of Mining



- Mining is a short-term land use
 - Effects are both short-term and long term
 - Short term effects
 - On site
 - Removal of vegetation
 - Aesthetics
 - Hydrology

Effects (Cont.)

- Off site
 - Blasting
 - Noise
 - Dust
 - Visual
 - Traffic
 - Flow rates in streams
 - Water quality changes

Effects (Cont.)

- Long term effects
 - Change in topography
 - Filling of valleys
 - Changing grade and elevation of hillsides
 - Change in drainage patterns
 - Revised aesthetics
 - Vegetation

Key Issues



- Short Term Effect Mitigation
- AOC
- AOC Variances and Post Mining Land Use
- Minimizing Disturbed Area

Minimizing Disturbed Area

- Recognize volume is needed for excess spoil
- Objective to reduce area disturbed outside mineral extraction area
- Have rational approach to determining optimum
- Use previously disturbed areas first

Approach

- Calculate Excess Spoil (AOC Model)
- Select valleys for fill consideration
- Calculate equal increments of capacity moving down valley
- End calculation at logical toe
- Have top surface above elevation of primary mining horizon
- Select optimum capacity to meet excess spoil

Approach (Cont.)

- Use area calculated from optimization as “disturbed area bank” in acres
- Add accepted acreage to reflect sub optimum
- Allow operator to apply bank to whichever valleys they want, in whatever order
- Any Amendment or adjacent permit has to be similarly optimized
- Variances always have an associated change in disturbed area from optimum