

# Ohio Department of Natural Resources Division of Mineral Resources Management MINE SAFETY



# ***DMRM Mine Safety Mandate***

- Enforce and support Ohio Mine Safety Laws
- Quarterly Underground Mine Inspections, and Surface Mine Inspection /Coal-IM
- Mine Rescue Emergency Preparedness and Response – Training of Mine Rescue Teams
- Mining Certification Testing of miners for Foreman, Mine Electrician, etc.
- Consulting resource for Mine operators
- Surface Annual Refresher Training of many of Ohio's Miners

# DMRM Mine Safety Staffing

Structure – Currently.... 27 Safety  
Professionals

*9 – Deputy Mine Inspectors of Underground  
Mining Operations*

4 – Mine Rescue Operations Coordinators

*9 – Deputy Mine Inspectors of Surface Mines*

4 – Supervisors

*Supervised by Mine Safety Program Manager  
Craig Corder – Cadiz JLS Training Center*



# *Underground Staff*

- Underground staff members of the DMRM have many years in industry of combined underground practical mining experience.
- Staff wears many hats of Mine Inspectors, Mine Rescue Response network members, Mine Trainers, and Professional Consultants, as experts in Mine Rescue, Statutory Compliance, Roof Control, Mine Ventilation and Mining Systems.
- Function as State Mine Rescue Team trainers, Emergency Response Preparedness responders, and Mine Rescue Training Competition judges.
- Many have completed ICS 300 training as instructed by ODNR Law Enforcement personnel

# May 2011 - Meeting with the IMCC

## *Interstate Mining Compact Commission*

*What is the IMCC?* .... State and federal agencies working together to share thoughts, ideas, and concerns, and to pool resources and work together to accomplish the goals of their respective legislative mandates as they pertain to Mine Safety, Permitting, Abandoned Mine Land Reclamation and other areas of natural resources stewardship.

# May 2011 - Meeting with the IMCC

## *Interstate Mining Compact Commission*

*What is the purpose of the IMCC upcoming Meeting for the Mine Safety portion of the IMCC? (to be held in Bruceton PA)*

Assistant Secretary of Labor Main has requested that states bring their Homeland Security personnel to the meeting for discussions as to how they might be able to assist Mine Rescue efforts in the event of a Mine Emergency similar to that of the Upper Big Branch Mine in the Spring of 2010.

# Joseph A. (Joe) Main

.... recent work focused on research and analysis on prevention of mine accidents and disasters, the development of training programs and facilities to prepare miners, rescue teams and emergency responders for mine emergencies...



**ASSISTANT SECRETARY  
OF LABOR  
FOR MINE SAFETY AND  
HEALTH**

# What are the DMRM's Major Responsibilities in Mine Safety?

- 
- Inspections of Mining Operations
  - Mine Rescue and Emergency Response Preparedness
  - Certifications of Industry Mining Officials
  - Training of Mine Rescue Teams and Miners



# Inspection of Mines is a Priority



“The Good Ol’ Days.....”



And the 'New Days' .....

# Low Seam – Miner Operator



# The Continuous Miner's 'Cutting Head – 38 inch seam





# DMRM Staff on Underground Inspection





30' high....and working to halt a  
'squeeze' ....





# Buckingham #7 Miners at Glouster







Morton Salt – Fairport Mine –  
Continuous Miner

# Morton Salt – 25 Ton Ram Car Salt Battery-Powered Hauler





# Cargill Salt Mine on Whiskey Island, Cleveland - Fire-Training Exercise







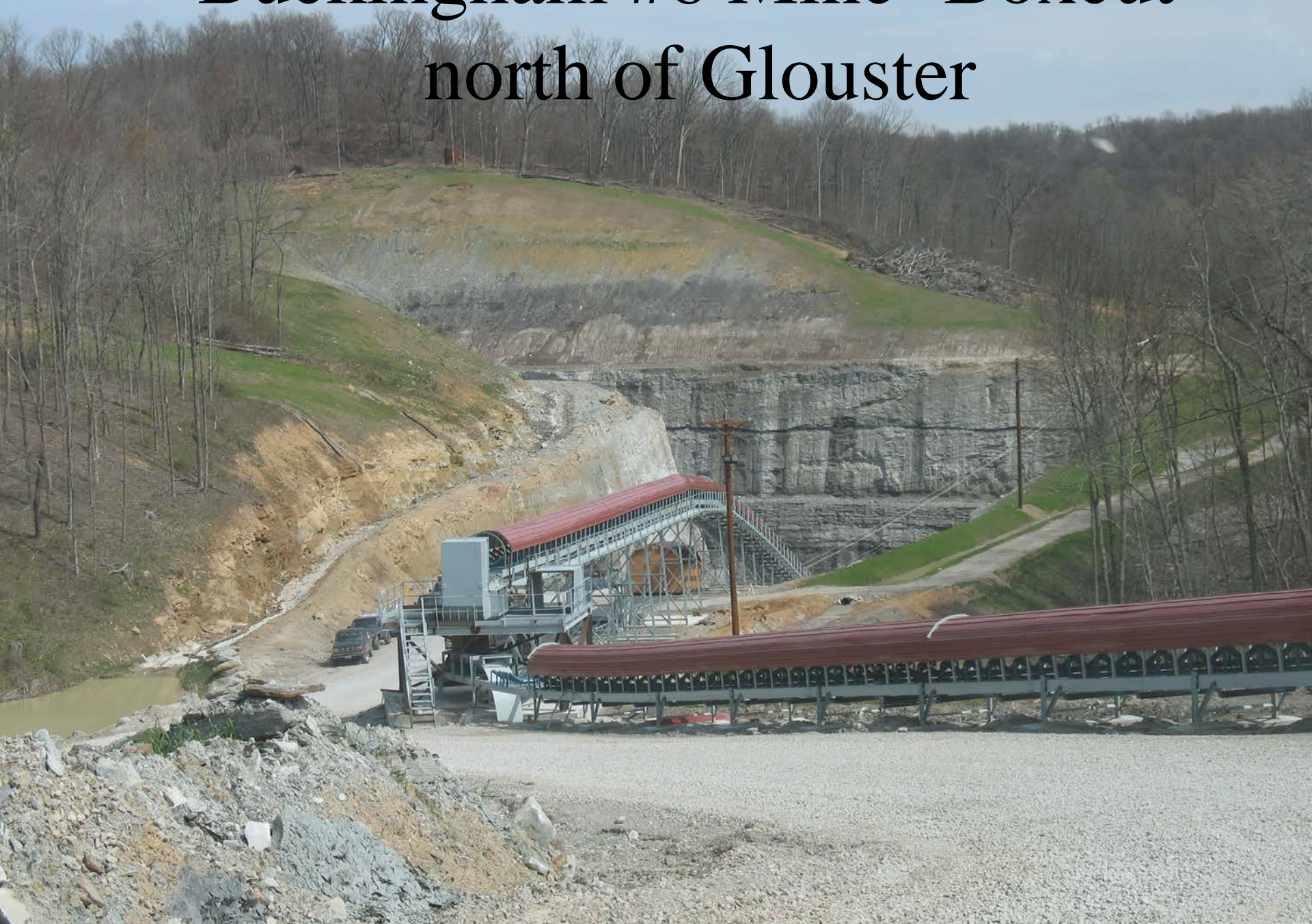


# New Belt slope development - American Energy Corporation's Century Mine near Beallsville



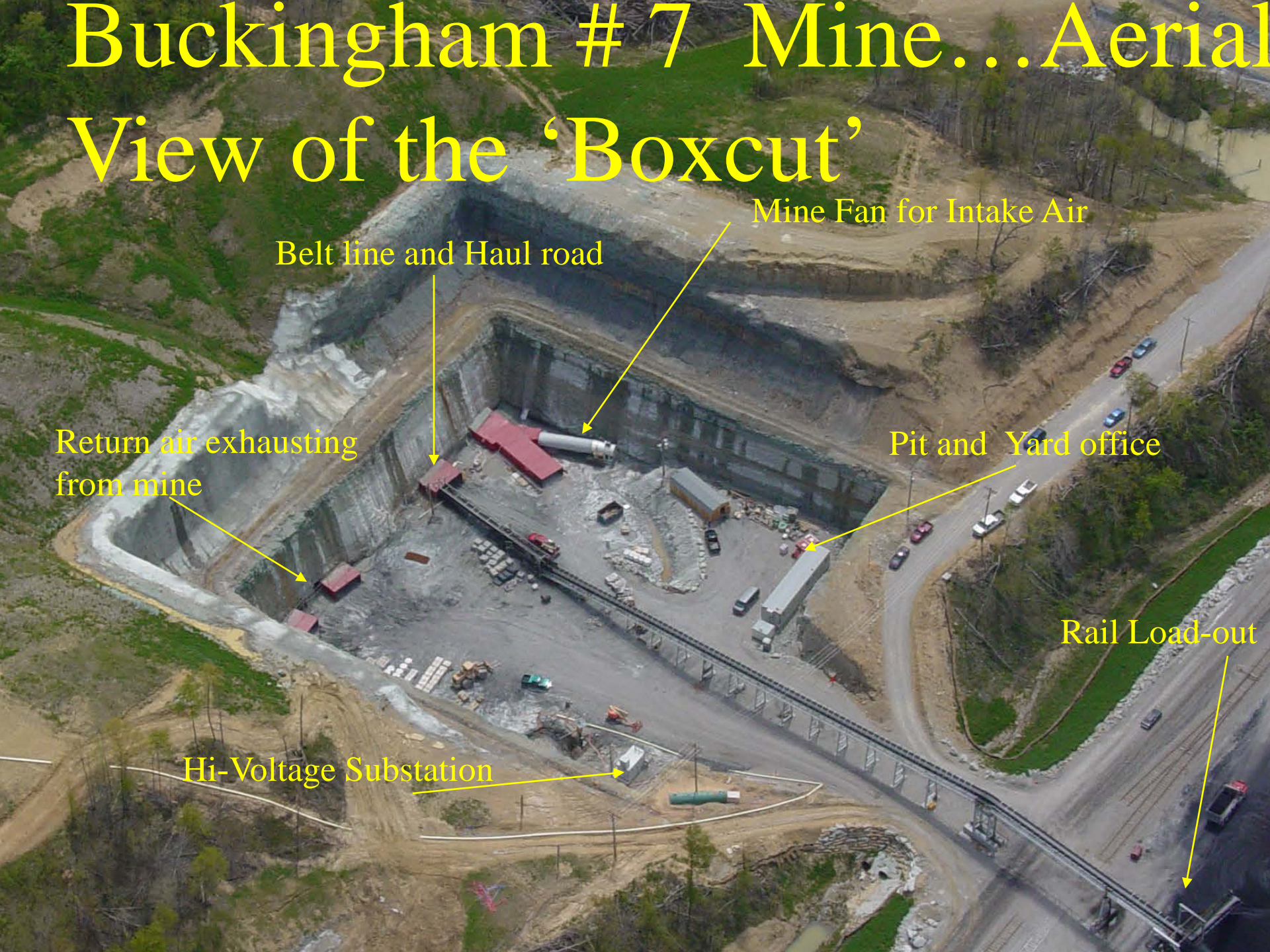


# Buckingham #6 Mine 'Boxcut' north of Glouster





# Buckingham #7 Mine...Aerial View of the 'Boxcut'



Mine Fan for Intake Air

Belt line and Haul road

Return air exhausting from mine

Pit and Yard office

Rail Load-out

Hi-Voltage Substation



# ODNR - Jerry L. Stewart Mine Safety Training Center - Established May 2009 – Renamed in June 2010





# Underground Mine Mine Map

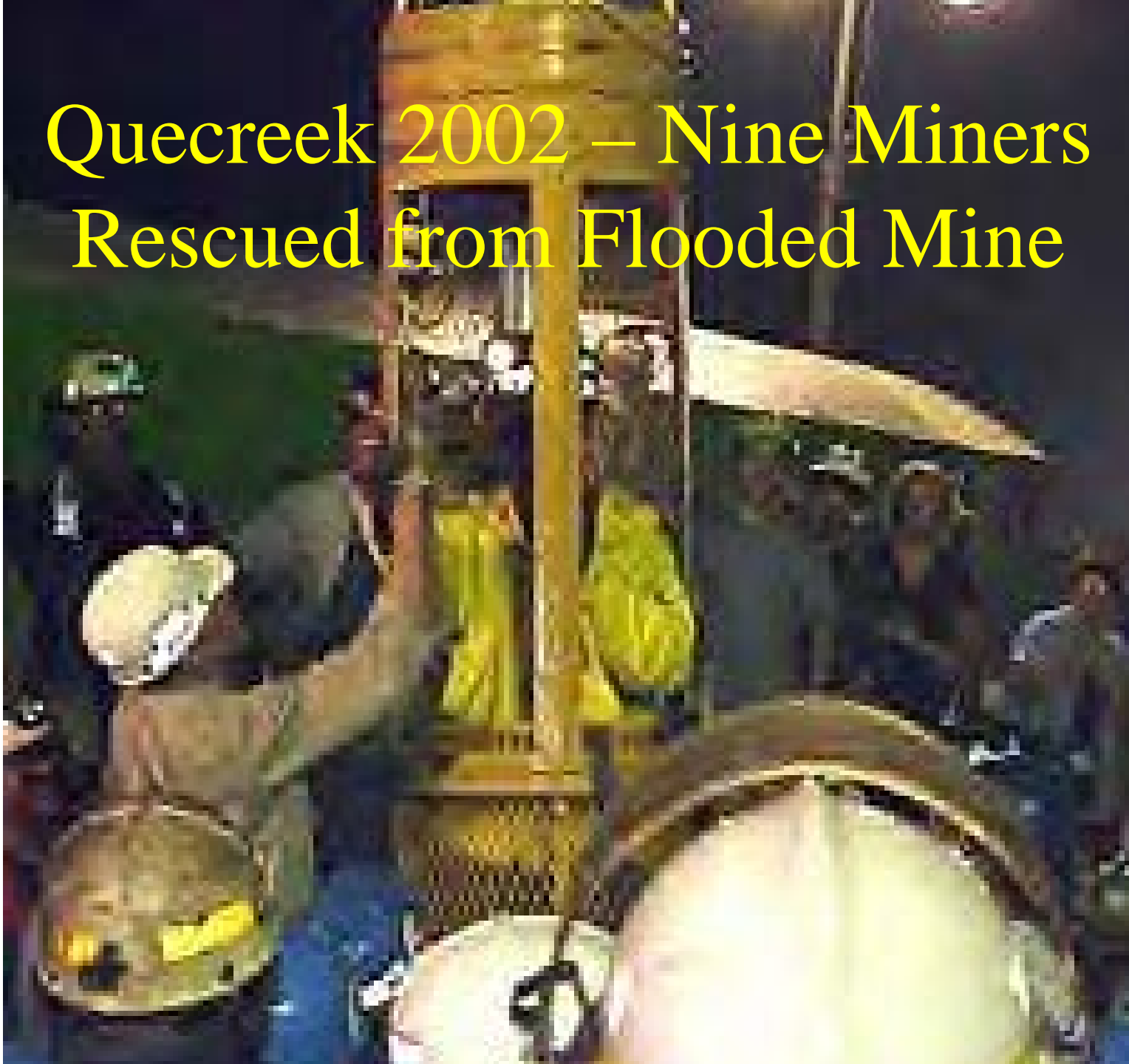




# Mine Rescue and Emergency Preparedness .....a High and Separate Priority



# Quecreek 2002 – Nine Miners Rescued from Flooded Mine



# Sago Mine WV – Barricade in January 2006

12 Miners killed...one miraculously survived...



Upper Big Branch  
April 05, 2010....  
29 Miners killed in Methane  
Gas & Coaldust explosion

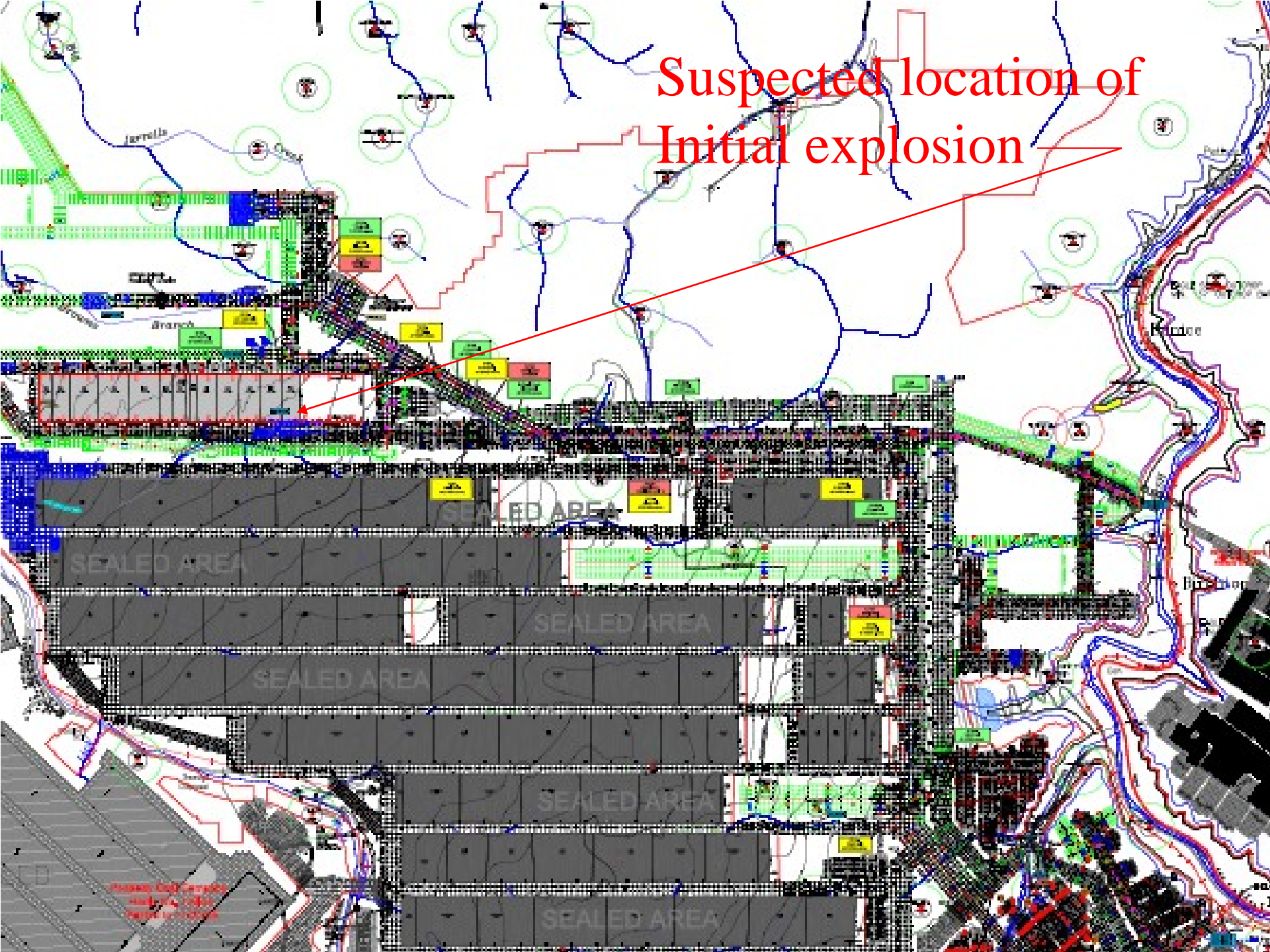






In Memory of  
All Our Miners

Suspected location of  
Initial explosion



SEALED AREA

SEALED AREA

SEALED AREA

SEALED AREA

SEALED AREA

SEALED AREA

Prohibit all persons  
from entering  
without permission







Rescue team from the Early  
1900s



# What is a Mine Rescue Team?



# State Mine Rescue Teams

- A Team is composed of at least six employee-miners from an underground mine who volunteer to train and be prepared for underground mine emergencies at their mine, and the mines which they cover.
- Teams are regularly trained by state Mine Rescue Operations Coordinators with assistance from Deputy Mine Inspectors (per guidelines of the MOU and national Federal Requirements.)

# DMMRM Mine Rescue Duties

*State Law (ORC)*- Comply with Requirements for Mine Rescue, Stations, Station Maintenance, & Teams Training.

*Memorandum of Understanding* between Ohio and the Mine Safety & Health Administration

*Training of state Teams* – Compliance with applicable state and federal laws governing Mine Rescue.

- § 49.20 Requirements for all coal mines.
- (a) The operator of each underground coal mine shall make available two certified mine rescue teams whose members—
  - (1) Are familiar with the operations of the mine, have a minimum of 96 hrs training per year, and
  - (2) Participate, at least annually, in two local Mine Rescue, MSHA-sanctioned, Training Competitions.



# SUMMARY OF MINE RESCUE RULE

- For each shift that miners work underground, there shall be a “*responsible person*” designated by the mine operator to take charge during mine emergencies.
- The responsible person shall be trained annually in a course of instruction in mine emergency response as prescribed by MSHA’s office of EP&D

- (2) The responsible person shall be trained annually in a course of instruction in mine emergency response, as prescribed by MSHA's Office of Educational Policy and Development. The course will include topics such as the following:
  - (i) Organizing a command center;
  - (ii) Coordinating firefighting personnel;
  - (iii) Deploying firefighting equipment;
  - (iv) Coordinating mine rescue personnel;
  - (v) Establishing fresh air base;
  - (vi) Deploying mine rescue teams;
  - (vii) Providing for mine gas sampling and analysis;
  - (viii) Establishing security;
  - (ix) Initiating an emergency mine evacuation;
  - (x) Contacting emergency personnel; and
  - (xi) Communicating appropriate information related to the emergency.
- (3) The operator shall certify by signature and date after each responsible person has completed the training and keep the certification at the mine for 1 year.

# Mine Rescue Team Training Requirements

- All teams must participate in two Mine Rescue Training Competitions (contests)
- All teams must be within 1-hour ground travel time from the rescue station to the covered COAL mine (2 hrs for Ind.Min.)
- All teams must participate in Mine Rescue training at each covered mine

In Ohio.....

Where are the Underground  
Mines?

What types of Underground  
Mines are there?

and.....

Where are the Mine Rescue  
Stations?



# Ohio Underground Mines

## Coal Mines - number of employees

- Ohio Valley Coal Powhatan #6 Mine (530)371
- American Energy Corporation
  - Century Mine (460)228
- Buckingham Mining Co. #7 Mine 70
- Buckingham Mining Co. #6 Mine 60
- Hopedale Mining LLC – Hopedale Mine 154
- Rosebud Mining LLC – Tusky Mine 44

# Ohio Underground Mines

## Coal Mines - number of employees

- Sterling Mining – Shean Hill Mine 3
- Sterling Mining – Carroll Hollow (5) 20
- Rosebud Mining – Bergholz 7 63
- Gatling Coal Corp – Yellowbush Mine

# Ohio Underground Mines Salt & LimeStone

## Industrial Minerals Mines - number of employees

- Arch Materials LLC – Batavia Mine 30
- Cargill De-icing Technologies (Salt)  
Cleveland Mine 150
- Morton Salt – Fairport Mine (Salt) 160
- East Fairfield - Petersburg Mine (11) 14
- East Fairfield – Subtropolis Mine (13) 12



# Ohio Underground Mines Salt & LimeStone

Industrial Minerals Mines - number of employees

- Shelly Materials – Castlerock Mine
- Sidwell Materials – Black 17 Mine



# Southeastern Ohio Mines



# Southwestern Ohio Mines

KENTUCKY





# New Coal Operations in permitting

- Big River Mining – Gatling LLC – Racine
- Rosebud Mining - Tuscarawas County

# What is a Mine Rescue Station?





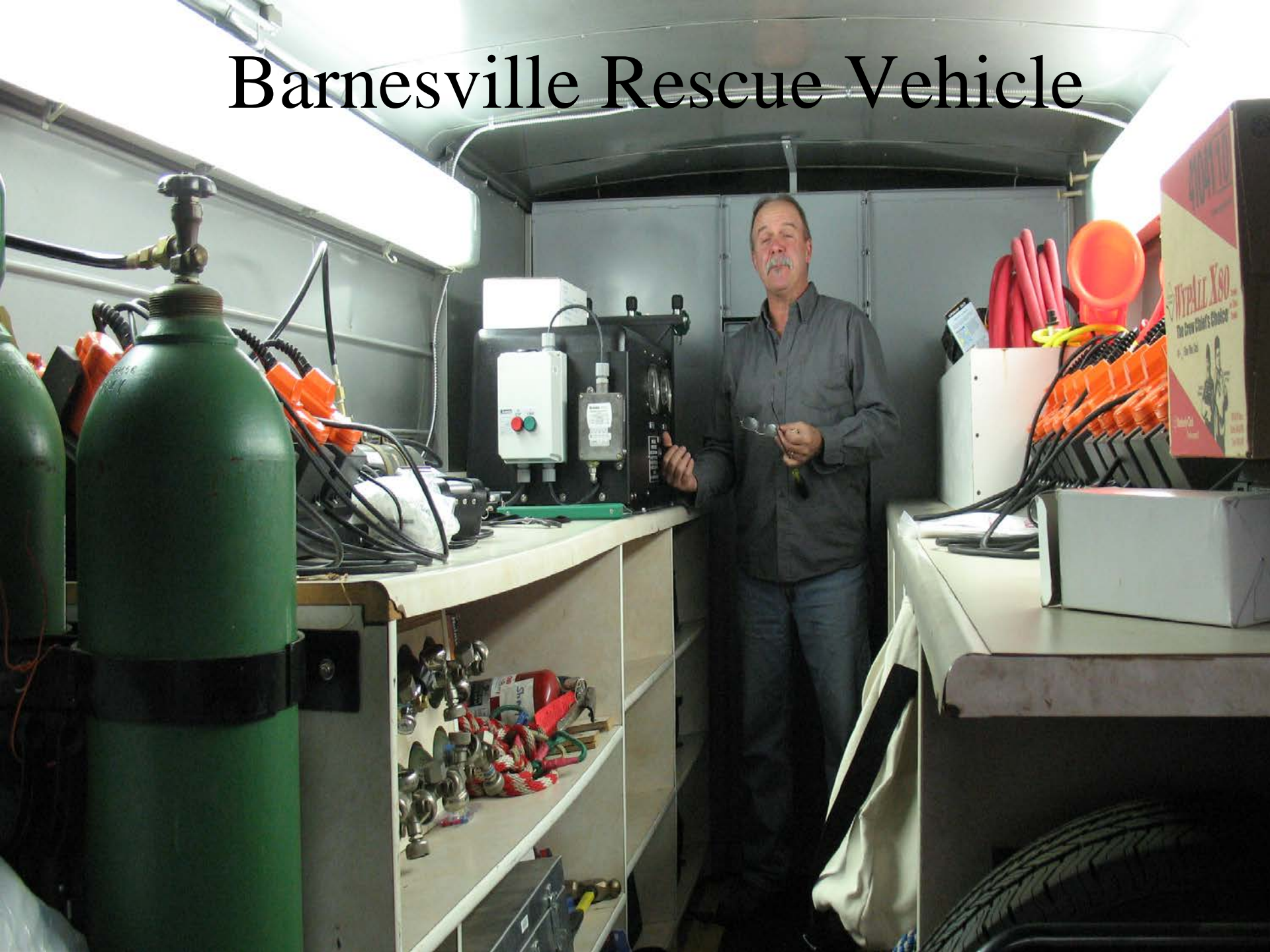
# A Mine Rescue Station is....

- A centralized location for equipment that now must be within a One Hour drive time of any **coal** mine it services. CFR /MOU require enough rescue apparatus for two teams, O<sub>2</sub> supplies, & all equipment to service & repair the apparatus, mine gases detection equipment, and a host of items necessary to support the teams in a response situation
- Four (4) Mine Rescue stations are required by state law in Ohio (SB 323 – 2008)

# Glouster Rescue Vehicle



# Barnesville Rescue Vehicle





# DMRM Mine Rescue Stations and Locations

*3 Stations at Present:*

Barnesville      740-425-3973

Cadiz      740-942-9150

Glouster      740-767-3396

Salem – under construction

Cambridge Ohio – Mobile Laboratory Van  
Jason McClarren, Lab Chemist – 740-439-5591



# Cambridge Mobile Laboratory Van, complete With Gas Chromatographs





# What is an Apparatus?

- A Mine Rescue apparatus is a “CCBA” (*Closed Circuit Breathing Apparatus*). We use a BG-4 unit developed by a German company called Drager..... 1<sup>st</sup> apparatus 1903.
- BG-4 is used by state Mine Rescue Teams to enter hazardous areas of an underground mine where the dangers of fires and noxious gases may be present.
- Ohio currently maintains 96 apparatus, 14 at each of the four stations, and valued at approximately \$10,000 each.



# Dräger BG-4





Testing the BG-4 with the RZ-25



A man with a beard and a camouflage baseball cap is working in a workshop. He is wearing a light-colored t-shirt and blue jeans. He is focused on a large, complex mechanical apparatus that is mounted on a wooden workbench. The apparatus has several black corrugated hoses and a blue component. In the background, there is a wall-mounted storage rack with many small, clear plastic drawers. To the left, there is a dark surface with a white star pattern and the word "SMOKE" visible. To the right, there is a window with yellow blinds and a desk with various items, including a blue funnel and a black container. The overall scene is a busy, cluttered workshop environment.

“Bench” - Testing the Apparatus  
to insure all systems in the unit  
are working properly....

# BG-4 Apparatus attributes

- BG-4 means ‘below ground – 4 hours’....
- ‘Positive Pressure System,’ is fully enclosed. Should a leak develop, the rescuer still remains isolated from the outside atmosphere.
- Capable of rapid turn-around, in that a fresh O2 bottle can be installed along with Dragorsorb and ice, and the unit can be quickly readied for re-use.

# Changes since Sago - 12 miners died, and 5 at Darby Fork - 2006

- New national coalmine requirements for Rescue Station locations to provide faster & more timely Rescue Teams response to Mine Emergencies
- New Law changes in Ohio, SB 323 of 2008
- Stricter oversight of emergency preparedness programs, response capabilities, and mine-site readiness.



# Issues for Mine Emergency

## Preparedness & Response

1. Miners' expectations when wearing a Self Contained Self Rescuers;
2. Judgment and decision-making process under the stress of a mine escape;
3. On-site management of mine emergency response during the initial event;
4. Emergency communications, including equipment function, and the transmission of appropriate important information;
5. Layout and marking of emergency escapeways in mines; lifelines, taglines, SCSR caches, etc.
6. Evaluation of mine emergency training programs and pre-planning activities, more routinely & rigidly conducted.

# The Emergency Operations Center and Mine Emergency Communications

- When is the EOC to be notified?
- How will the EOC work with the DMRM Mine Emergency Response?
- Is there a Plan in place to provide accurate information and direction?

# The Emergency Operations Center and Mine Rescue Response

- EOC is to be notified *only* in the event of a true Mine Emergency, such as fire, explosion, or *any* incident in which Mine Rescue Teams are, or *may*, be needed.
- DMRM's – Current Mine Emergency Response Program document posted to all mine operators, and on the DMRM mainframe in Columbus.



# Considerations in a Mine Emergency

- Bring to bear all necessary logistical, technical and material resources that may be needed to handle the emergency, on a case by case basis.
- Coordination of MSHA/EMS / EMA responses
- Coordination of various law enforcement agencies' efforts that are responding to the emergency
- Off-site Scene, Crowd and Traffic Control
- Keeping the Media 'frenzy' at bay

# In a Mine Emergency, How is the Command Center Structured?

The *Command Center* for a Mine Emergency is composed of three people only:

1. A company representative trained in Mine Rescue
2. A supervisor or manager of the State DMRM Mine Safety staff skilled in Mine Rescue
3. A representative of the Mine Safety & Health Administration (MSHA)

# Command Center

The *Command Center* has complete and final jurisdiction and control over the rescue effort, and is solely responsible for directing and staging the Mine Rescue teams.

The *Command Center* is in constant communication with the Fresh Air Base from which all exploration originates, but only by orders from the Command Center



# Logistical Support to the Command Center

Other Emergency responders such as EMS agencies and law enforcement personnel will be organized to provide logistical support for acquiring and mobilizing personnel and material resources for dealing effectively with the response, and as outlined in the specific mining operation's Emergency Response Plan.  
(ERP)

The Mine Improvement and New Emergency Response Act, commonly known as the *Miner Act* was enacted in 2006.

The *Miner Act* amends the Federal Mine Safety and Health Act of 1977.

This *Act* requires the Mine Operator .....

1. ....to carry out continuously a program to improve accident preparedness and response at each mine; and
2. ....to adopt and update accident response plan for evacuations and for maintenance of individuals trapped underground.

The *Emergency Response Plan* is to be continuously reviewed, updated and re-certified by MSHA every six months and reviewed by the DMRM Mine Safety staff.



# How can the EOC & ODNR Law Enforcement work with the Mine Emergency Response?

- Coordinate & enable proprietary or encrypted communications among the state agencies and other official agencies involved.
- Provide support for the use of Multi-Agency Radio Communications System (MARCS)
- ICS – Homeland Security ODNR Law Enforcement - Bring first-hand experience and expertise in dealing with communication and other logistical problems learned from past emergency situations.

# How can the EOC work with the Mine Emergency Response?

- Communicate with various law enforcement agencies who have responded to the emergency so efforts are not duplicated.
- Provide logistical support such as the Mobile Command Center equipment, Communications Vehicle, MARCS Radio and encrypted communications support.
- Homeland Security knowledge base resource and advice – Consultants

# **Mine Emergency Response Opportunities as Identified by the IMCC (International Mining Compact Committee)**

- Need for Improved Cooperation
- Sharing of Resources
- MERD Training – MSHA, State, Local, Industry, Labor
- Need to have Operators Assess Risks & Plan for Contingencies
- Develop Mine Emergency Organizational Structure
- Command and Control – Who Will Staff Command Center?
- Need to Assess Competency of Responsible Persons
- Need Realistic Skills Training for Mine Rescue Teams
- Need to Assess Readiness and Skill Levels of Teams
- Operators Need to Develop Mutual Aid Agreements, Legal Agreements with other Operators for Mine Rescue Services

Operators Need to Develop Mutual Aid Agreements, Legal Agreements with other Operators for Mine Rescue Services

- Need Operators to Develop Fire Brigades
- Need to Develop and Continually Update Lists of Inert Gas Vendors,

Drillers, Other Service Providers

- Miners Need to be Trained for Preparedness
- Will Systems (Communications, Tracking, Mine-Wide Monitoring) work after an event? Need for Hardened Systems
- Pre-Surface Surveying of Key Underground Locations Needs to be Done
- Miners Must be Trained to Escape First, Take Shelter as a Last Resort



- New Issues Regarding Introduction of Refuge Alternatives

Supplemental Communications from a Borehole

- oSupplemental Air/Oxygen from a Borehole

- oCommunications with Family Members

- oMine Rescue Team Issues

- Analysis of Mine Gases

Sampling

- oHigh Range Detectors

- oGas Chromatographs

- Family Liaisons (MSHA, State, Operators)

- Sharing Resources with Other Operators

# ODNR Law Enforcement

