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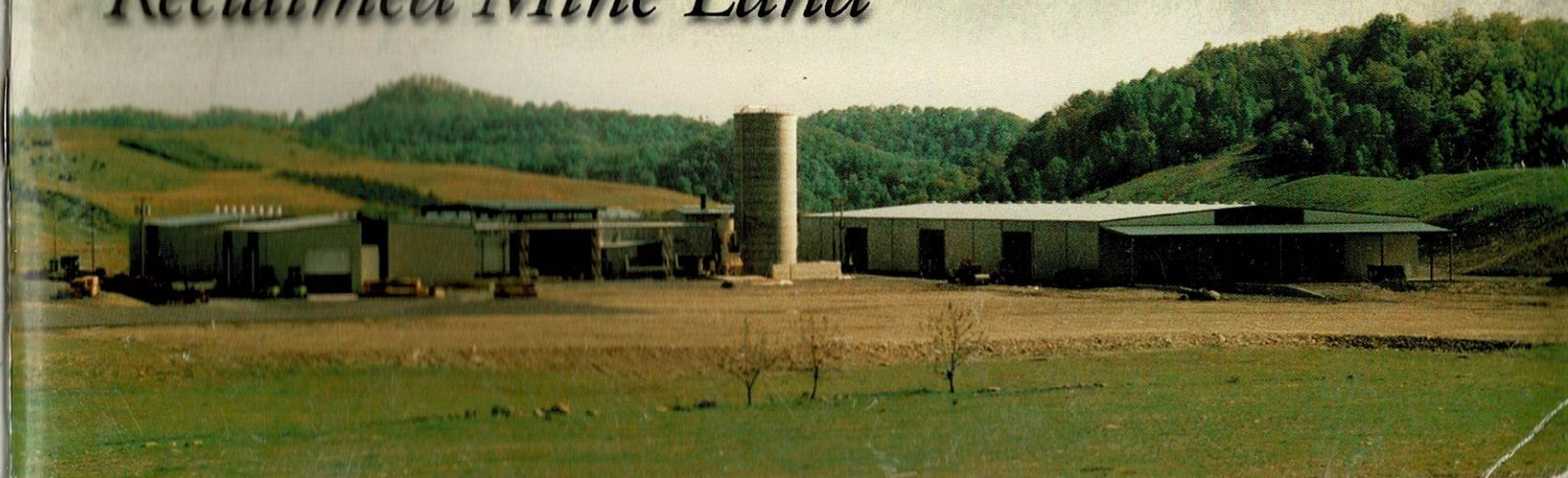
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Green Lands

Fall 2000



*Making the Most of
Reclaimed Mine Land*



Green Lands

Volume 30 Number 4

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with offices at 1624 Kanawha Boulevard East
Charleston, West Virginia 25311
(304) 346-5318, FAX 346-5310
E-Mail: wvmra@wvmra.com



On the Cover

After Arch Coal reclaimed its Hobet 07 mountaintop mine site, Mingo County officials in conjunction with federal, state and private business leaders, constructed a wood products industrial park that is expected to employ 1,000 people in 10 years. See story on page 30.

WVMRA

Staff & Board of Directors

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J. C. Supcoe - Hansford
C. R. Sutton - Jane Lew
D. S. Walker - Charleston
J. H. Wellford - Charleston
K. G. Woodring - St. Louis, MO
G. O. Young - Charleston
T. P. Zeli - Charleston

Honorary Members

C. E. Compton - Bridgeport
L. W. Hamilton, Jr. - Hansford
J. C. Justice, Sr. - 1924-1993
F. B. Nutter, Sr. - Ft. Lauderdale, FL
L. A. Streets - 1926 - 1998
L. A. Vecellio, Sr. - 1915-1996



L-1000

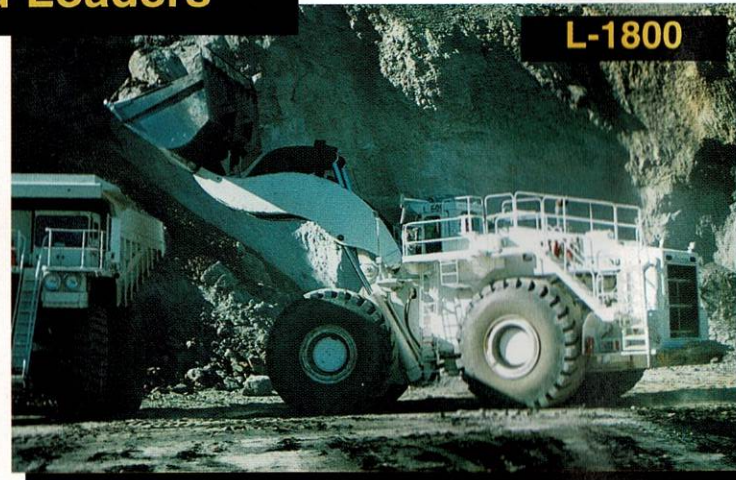


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L-1800

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L-1000, L-1100, L-1400, and L-1800, LeTourneau offers the largest complete line of production front end loaders available.

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	L-1000	L-1100	L-1400	L-1800
Operating Payload				
Standard	51,000 lbs. (23,133 kgs.)	66,000 lbs. (29,937 kgs.)	84,000 lbs. (38,102 kgs.)	100,000 lbs. (45,360 kgs.)
High Lift	48,000 lbs. (21,733 kgs.)	60,000 lbs. (27,216 kgs.)	78,000 lbs. (35,381 kgs.)	94,000 lbs. (42,638 kgs.)
SAE-Rated Bucket Capacity				
Standard	17 yd ³ (13.00 m ³)	22 yd ³ (16.82 m ³)	28 yd ³ (21.4 m ³)	33 yd ³ (25.2 m ³)
High Lift	16 yd ³ (12.00 m ³)	20 yd ³ (15.29 m ³)	26 yd ³ (19.9 m ³)	31 yd ³ (23.7 m ³)
Dump Heights				
Standard	18'-5" (5.61 m)	18'-10" (5.74 m)	21'-6" (6.55 m)	22'-0" (6.71 m)
High Lift	19'-10" (6.04 m)	20'-0" (6.10 m)	23'-6" (7.16 m)	24'-0" (7.32 m)



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Capelli Elected Chairman for 2000-01 Term

Stephen G. Capelli, senior vice president of operations for Pen Coal Corp., was elected the WVMRA chairman for 2000-01 during the Association's 34th annual meeting in White Sulphur Springs on August 3-5.

Steve succeeded William E. "Bill" Broshears of St. Louis, MO who served as WVMRA chairman during the 1999-2000 term.

"I am honored to be elected WVMRA chairman," Steve said. "Bill did a great job and I hope I can continue his momentum and keep moving the industry forward."

"The coal industry runs deep in my family," he said. "I am proud to be known as the 4th generation working in coal."

Born in Prestonsburg, KY, Steve's career in the coal industry spans over three decades. After graduating from Virginia Tech with a B.S. in

Mining Engineering in 1973, he went to work for Cannelton Industries in Raleigh County, then moved on to Armco, Pittston, Slab Fork and Carter Roag to round out the 1970's.

In 1980, Steve began his own business, eventually known as Bentley Coal Co., which operated in Randolph and Barbour counties. He later sold the company to Amax in 1988.

Then in 1990, Steve went to work for Amvest primarily developing the Fola property in Clay County. After a four-year stint there, Steve was hired by Pen Coal Corp. and has been there for the past six years.

He is also Secretary of the Kentucky Coal Association.

As the new WVMRA chairman, Steve understands that this coming year continues to be one of the more challenging times in the coal industry and stresses we



Capelli, senior vice president at Pen Coal Corp., is the 4th generation in his family to work in the coal industry.



New WVMRA Chairman, Steve Capelli, with his wife, Carolyn, take a moment for the camera during the WVMRA annual meeting.

The Capellis, who have been married for 27 years, reside in Charleston and have two children, Greg and Amy.

(Continued on page 38)

Previous WVMRA Chairmen

1966-67	Leo A. Vecellio, Sr.	1983-84	Tracy W. Hylton
1967-68	F.B. Nutter, Sr.	1984-85	Carl DelSignore
1968-69	Arch F. Sandy, Jr.	1985-86	Dwight M. Keating
1969-70	John C. Anderson	1986-87	Theodore J. Brisky
1970-72	G.B. Frederick	1987-88	James W. Anderson
1972-73	James L. Wilkinson	1988-89	Roy G. Lockard
1973-74	Lawson W. Hamilton, Jr.	1989-90	Paul F. Hutchins
1974-75	James C. Justice, Sr.	1990-91	Kenneth J. Woodring
1975-76	H.L. Kennedy	1991-92	R. Donald Cussins
1976-77	Frank D. Jennings	1992-93	Gerald W. Ramsburg
1977-78	James H. "Buck" Harless	1993-94	John R. Bryan
1978-79	John J. Faltis	1994-95	Sidney R. Young, III
1979-80	Charles T. Jones	1995-96	K. Donald Nicewonder
1980-81	Lawrence A. Streets	1996-97	Markus J. Ladd
1981-82	William C.M. Butler, III	1997-98	James C. Justice, II
1982-83	Donald R. Donell	1998-99	Wayne H. Stanley
		1999-00	William E. Broshears

WVMRA Officers for 2000-01



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Steve Capelli
Charleston



1st Vice President
Jim Bunn
Grundy, Va.



2nd Vice President
Kevin Bealko
Bridgeport



Treasurer
John Skidmore
Charleston



Secretary
Bruce Sparks
Morgantown



Associate Chairman
Dan Pochick
Bluefield

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Acordia Employers Service (Tom Cloer) - \$50
Arch Coal, Inc. (Peter Lawson) - CD Player
Black Diamond Construction, Inc. (Bill Casto) - \$200
Carter Machinery Company
(John Humphries) - \$100
Cecil I. Walker Machinery Company
(Steve Walker) - \$50
Crown Hill Equipment, Inc. (Chris Supcoe) - \$100
Cummins Cumberland, Inc. (Jack Apple) - \$100
Dyno Nobel, Inc. (Grant Shrader) - VCR
Eastern Associated Coal Corp.
(Fred Conner) - Portable TV
EICO, Inc. (John & Eda Bussey) - \$50
The Ensign-Bickford Company
(Dick Gotcher and Mike Burrell) - \$100
Kanawha Eagle Coal, LLC (Jim & Kay Bunn) - \$100
Nelson Brothers, LLC (Tim Zeli) - \$100
Pace Carbon Fuels (Jim Treptow) - \$100
Pen Coal Corporation (Steve Capelli) - \$100
RMI, Ltd. (Jack Grimm) - \$50
Republic Industries (John Krebs) - Gold Coin
United Central Industrial Supply (Jim Tate) - \$100

CHILDREN'S PUTTING TOURNAMENT

Austin Powder Company
(Herm DeProspero) - Trophies
Cascades Coal Sales (Flick Goldsmith) - \$50
Cummins Cumberland, Inc. (Jack Apple) - \$25
Dyno Nobel, Inc. (John Stoehr) - \$25
The Ensign-Bickford Company (Dick Gotcher) - \$50
Pen Coal Corporation (Steve Capelli) - \$50
Triangle Surety Agency, Inc.
(John Jacobs) - 2 - \$50 bonds
Worldwide Equipment (Terry Dotson) - \$50 bond

FISHING TOURNAMENT

Carter Machinery Company (John Humphries) - \$75
Dyno Nobel, Inc. (John Stoehr) - \$25
EICO, Inc. (John & Eda Bussey) - \$50
Pen Coal Corporation (Steve Capelli) - \$25
Potesta & Associates, Inc. (Dana Burns) - \$50

NAME TAG DRAWING

Acordia Employers Service (Tom Cloer) - \$50
Anderson of West Virginia (Dave Gettman) - \$50
Arch Coal, Inc. (Peter Lawson) - 35 mm Camera
Artistic Promotions (Shannon Westerman) -
Golf Bag
Bill and Marilyn Broshears - CD Player
Bright Enterprises (Bill Bright) -
Golf at Glade Springs Resort
Cecil I. Walker Machinery Company
(Steve Walker) - \$100
Crown Hill Equipment, Inc. (Chris Supcoe) - \$100
Cummins Cumberland, Inc. (Jack Apple) - \$50
Dyno Nobel, Inc. (John Stoehr) - \$50
EICO, Inc. (John & Eda Bussey) - \$50
The Ensign-Bickford Company
(Dick Gotcher and Mike Burrell) - \$100
The Greenbrier (Lee Doggett) -
Weekend at The Greenbrier
Hitachi Construction Machinery
(Braxton Griffin) - Briefcase
K & P Mining (Mike Perilli) - \$50
Kanawha Eagle Coal, LLC (Jim & Kay Bunn) - \$100
Nelson Brothers, LLC (Tony Nelson) - \$100
Pace Carbon Fuels (Jim Treptow) - \$100
Pen Coal Corporation (Steve Capelli) - \$100
Pritchard Mining Company (Andrew Jordon) -
\$100 (Schwabe Gift Certificate)
Rish Equipment Company (Dan Pochick) - \$100
RMI, Ltd. (Dave Haden) - \$50
Rudd Equipment Company (Bruce Meeker) - \$50
United Central Industrial Supply (Jim Tate) - \$100

FUN RUN

August Environmental, Inc.
(C. J. Cira & Benjie Greene) - \$100
Cecil I. Walker Machinery Company
(Steve Walker) - \$50
Cummins Cumberland, Inc. (Jack Apple) - \$50
Dyno Nobel, Inc. (John Stoehr) - \$50
The Ensign-Bickford Company
(Dick Gotcher and Mike Burrell) - \$50
Nelson Brothers, LLC (Charlie Miller) - \$100

GOLF TOURNAMENTS

Acordia Mid-Atlantic (Jerry Neal) - Big Bertha Driver
Anderson of WV (Dave Gettman) -
\$10,000 Hole-In-One
August Environmental, Inc.
(C. J. Cira & Benjie Greene) - \$100
Carter Machinery Company
(John Humphries) - \$100
Cecil I. Walker Machinery Company
(Steve Walker) - \$100
Dyno Nobel, Inc. (John Stoehr) - \$50
EICO, Inc. (John & Eda Bussey) - \$50
The Ensign-Bickford Company
(Dick Gotcher and Mike Burrell) - \$50
Kanawha Eagle Coal, LLC (Jim & Kay Bunn) - \$100
Long-Airdox Company (Andrew Paul) - Golf Bag
Logan Corporation (Joe England) - Golf Bag
Nelson Brothers, LLC
(Tab Hudson & Danny Perry) - \$200
Pace Carbon Fuels (Jim Treptow) - \$100
Pen Coal Corporation (Steve Capelli) - \$100
Petroleum Products, Inc. (Tom Taylor) - \$100
Rish Equipment Company (Dan Pochick) - \$100
RMI, Ltd. (Charlie Morton) - \$100
Rudd Equipment Company (Bruce Meeker) - \$100
United Central Industrial Supply (Jim Tate) - \$100

CHILDREN'S BOWLING TOURNAMENT

Austin Powder Company
(Herm DeProspero) - Trophies
Carter Machinery Company (John Humphries) - \$25
Cascades Coal Sales (Flick Goldsmith) - \$50
Cummins Cumberland, Inc. (Jack Apple) - \$25
Dyno Nobel, Inc. (John Stoehr) - \$25
Pace Carbon Fuels (Jim Treptow) - \$50
Pen Coal Corporation (Steve Capelli) - \$25
Triangle Surety Agency, Inc.
(John Jacobs) - 2 - \$50 bonds
Worldwide Equipment (Terry Dotson) - \$50 bond

TRAP TOURNAMENT

Carter Machinery Company (John Humphries) - \$50
Cecil I. Walker Machinery Company
(Steve Walker) - \$50
Dyno Nobel, Inc. (John Stoehr) - \$50
EICO, Inc. (John & Eda Bussey) - \$50
The Ensign-Bickford Company
(Dick Gotcher and Mike Burrell) - \$50
Hitachi Construction Machinery
(Braxton Griffin) - Hitachi Knife
Kanawha Eagle Coal, LLC (Jim & Kay Bunn) - \$100
Nelson Brothers, LLC (Gary Self) - \$100

TENNIS TOURNAMENTS

Carter Machinery Company
(John Humphries) - \$100
Cascades Coal Sales (Flick Goldsmith) - \$50
Cecil I. Walker Machinery Company
(Steve Walker) - \$100
Cummins Cumberland, Inc. (Jack Apple) - \$50
Dyno Nobel, Inc. (John Stoehr) - \$50
The Ensign-Bickford Company
(Dick Gotcher and Mike Burrell) - \$100
K & P Mining (Mike Perilli) - \$50
Kanawha Eagle Coal, LLC (Jim & Kay Bunn) - \$100
Nelson Brothers, LLC (Jon Giesen) - \$100
Pen Coal Corporation (Steve Capelli) - \$100
Pocahontas Land Corporation (John Payne) - \$50
Skelly and Loy, Inc. (John Gunnett) - \$100

BOWLING TOURNAMENT

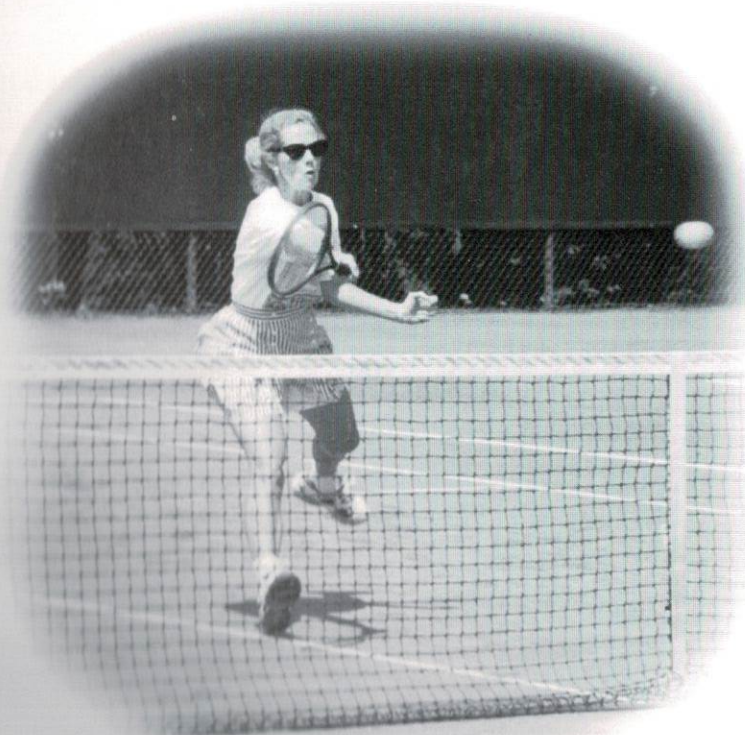
Carter Machinery Company (John Humphries) - \$50
Cascades Coal Sales (Flick Goldsmith) - \$50
Cecil I. Walker Machinery Company
(Steve Walker) - \$50
Cummins Cumberland, Inc. (Jack Apple) - \$50
Dyno Nobel, Inc. (John Stoehr) - \$25
EICO, Inc. (John & Eda Bussey) - \$50

WVMRA Annual Meeting

Snap Shots



(Left) C.J. and Tami Cira show that a family that competes in the Fun Run together, stays together; (Bottom) Andrew Jordan helps his son, Tyler, during the children's putting contest and (Bottom left) Beth Daniels attacks the net in the members' tennis tournament.



(Top) Pat Graney uses a little body English on Walt Dial's putt during the men's golf tournament; (Top right) Mary Supcoe foot faults in the bowling competition; and (Bottom) Anne King makes a recovery shot from the sand trap in the ladies golf tournament.



Company Pride

General Division

1st Place - "Buck Bunch"



Company Pride awards are given at the WVMRA Annual Meeting during the Friday night "Coal Miners Party."

Contestants are judged on their display of shirts, caps or other apparel as well as creativity.

The winner claims possession of the traditional bronze lunch bucket for the year, then receives a permanent plaque commemorating the award at the following year's WVMRA Annual Meeting.

Every year it is fun to watch the competition among companies as well as everyone having a good time.

Perennial powerhouse of the nineties, "Buck's Bunch," resurfaced to grab top honors in the General Division. "Buck's Bunch" has been awarded top honors eight times in the last 10 years.

Runner Up - Arch Coal



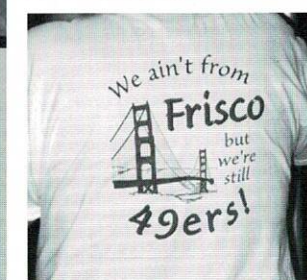
Arch Coal gave the "Bucks Bunch" group a run for their money this year, as they were named Runner Up in the Company Pride - General Division. Arch has placed in the last three consecutive years.

Honorable Mention

Ford Coal Company



Another perennial contender in the Company Pride - General Division is the Ford Coal Company. Every year, everyone on Kate's Mountain anxiously awaits to see the new and creative t-shirts they present for the Company Pride competition.



Company Pride

Associate Division

1st Place - Rish Equipment



After two years straight seeing the runner up spot, Rish Equipment captured top honors in the Company Pride - Associate Division this year defeating last year's champion, Rudd Equipment.

Runner Up - Rudd Equipment



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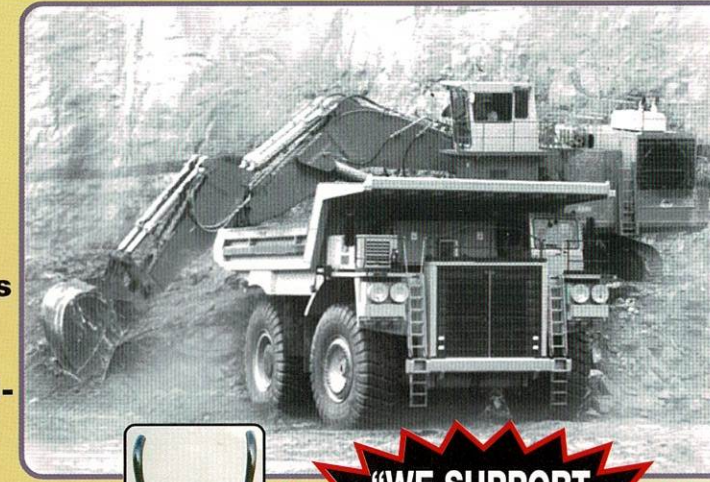
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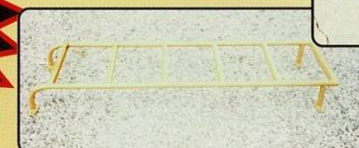
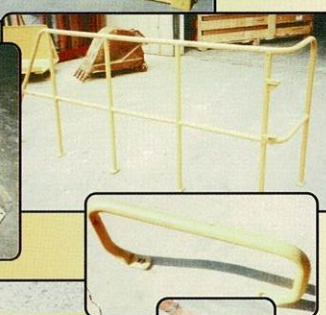
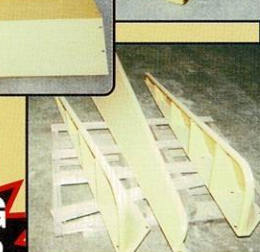
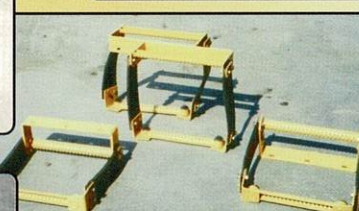
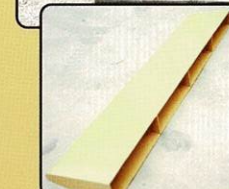
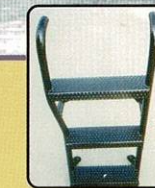
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1999 Company Pride Winners

"Buck's Bunch"

Bill Broshears (far left), past WVMRA chairman and Steve Capelli current chairman, present a plaque to Bill Shewey of "Buck's Bunch" as last year's winner in the Association's Company Pride - General Division.



Rudd Equipment



Bill Broshears (far left), past WVMRA chairman and Steve Capelli current chairman, present a plaque to Bruce Meeker of Rudd Equipment Company as last year's winner in the Company Pride - Associate Division.

More from Kate's Mountain



(Above) Dancing is always the popular after-dinner activity as the group shows that the *electric slide* is still alive and kicking.

(Right) Maroon was the featured color during Kate's Mountain as shown here by (l-r) Dan Miller, WVMRA; Myron Jones, Rish Equipment; and Peter Lawson, Arch Coal. Is this a coincidence or does the new WVMRA chairman's alma mater have any influence with their choice of color?





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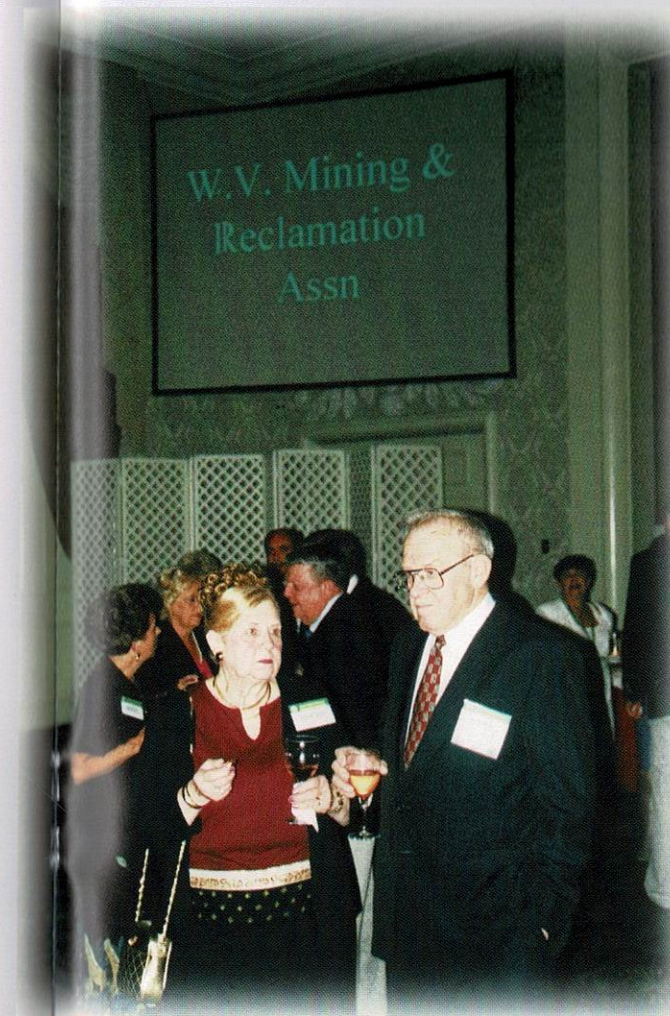
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The threat of rain brought the reception inside, but everyone still enjoyed the event.
 (Above) Kris Levy speaks with Marlene Meade; (Below) Tom Taylor holds on to Joyce Troitino and Anne King; and (Left) Dick and Louise Urda enjoy the reception.



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Deja Vu

Presidential Candidate, George W. Bush, Visits West Virginia for a Second Time

For the second time in two months, Texas Governor and Presidential Candidate, George W. Bush, made the trip to West Virginia, two times more than his opponent, Vice President Al Gore.

On October 2nd, Bush stopped in Huntington and was greeted by sky divers, fireworks and a crowd of close to 5,000 enthusiastic people in the city's Harris Riverfront Park.

A large group of people working or associated with the coal industry, packed the stage to support Bush while he spoke to the cheering crowd.

"I wanted to stop off in a state where I have a good chance of winning and where the stop would have an impact," Bush said in an interview with the Daily Mail after a rally here Monday. "People in West Virginia are going to hear that I came."

In Bush's first visit, Dick Kimbler, president of United Mine Workers Local 2935 who once worked at the now closed Dal-Tex mine said "I'm telling my people to not vote for Gore." Apparently he has not altered from that opinion as he wore a UMWA jacket and hard hat when introducing Bush to the roaring crowd in Huntington.

Bush made a commitment to clean coal technology, committing to spend \$2 billion in that area if elected. Such technology could help the country achieve energy independence without damaging the environment, he told the crowd.

"They see coal as a threat," Bush said. "I see

it as an opportunity to make the United States less dependent on foreign oil."

Gov. Cecil Underwood, who preceded Bush on stage as he did in the candidate's first visit to the state, said hundreds of miners in West Virginia have lost their jobs because of the current administration's anti-energy policy.

In Bush's previous visit, Underwood is famous for his statement that Vice President Gore would only be interested in the military if someone told him "that the Navy Seals are on the Endangered Species List."

Possibly a coup for the coal industry is that coal representatives were the only ones to have a private conversation with Bush while he was in Charleston during his August visit.

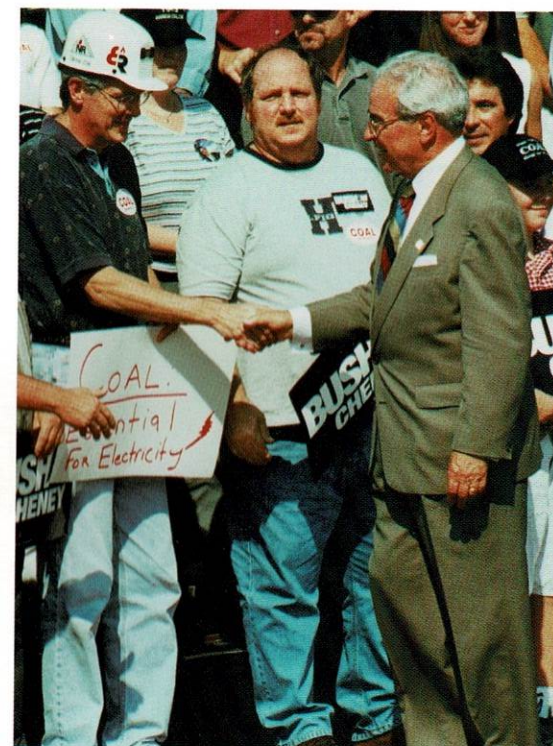
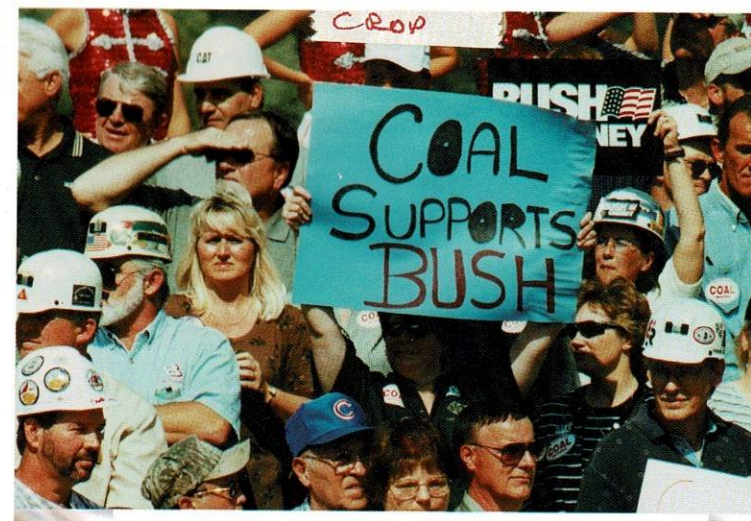
Coal Association President Bill Raney and Kimbler were able to meet with Bush at the Yeager Airport for about 10-15 minutes prior to his speech before several thousand people on the Capitol grounds.

But the real impact of the meeting, according to Raney, was the follow-up he received from Bush's campaign staff.

Not only did they get to meet with Bush, but about an hour and a half later, Don Evans, Bush's campaign chairman, called Raney during the Republican convention in Philadelphia as a follow up of the Bush meeting.

"I can't even get people in Charleston to call me back that quickly," Raney said. "And that quick turnaround showed a real interest in our issues."

Raney said the two talked about the need for a more "consistent, dependable format" for issuing mining permits.



(Top) Bush gives two thumbs up to a cheering crowd of about 2,500 in Huntington's Riverfront Park; (Middle Right) more than 50 coal representatives show their support for Bush while on stage; (bottom) West Virginia Governor, Cecil Underwood, takes a moment with Danny Cox prior to Bush speaking; and (Middle Left) UMWA President of Local 2935, Dick Kimbler, introduces Bush to the Huntington crowd.

Ground Broken for New Golf Course on Mountaintop Mining Operation

Ground was broken in August on a mountaintop mining site that will soon be transformed into the Twisted Gun Golf Course located just outside of Gilbert in Mingo County.

The 18-hole course will encompass approximately 230 acres, including about 10 acres of wetlands that did not exist prior to the mining operation. In time, the developers hope that the course will become part of the proposed West Virginia Golf Trail.

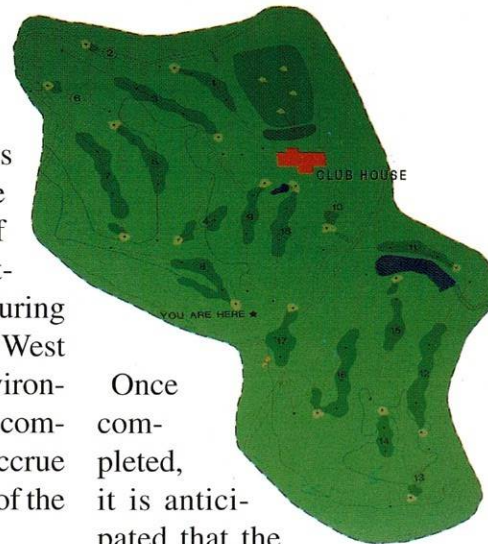
About 200 people were present to hear West Virginia Governor Cecil Underwood, as well as other state elected officials, discuss the positive future of post mining land sites such as this one.

In 1995, Mingo Logan Coal Company, Pocahontas Land Corporation and Premium Energy Corporation entered into an

agreement for the mining of the Low Gap surface mine, which is part of the Mingo Logan mining complex in Wharncliffe.

The three companies jointly agreed to pursue the development of a golf course as the mine's post-mining land use. After securing permit approval from the West Virginia Department of Environmental Protection, the three companies set up accounts to accrue money for the construction of the course.

"The Twisted Gun Golf Course will provide a wonderful recreational opportunity for the people of southern West Virginia. Furthermore, as one of the few links-style courses in the state, Twisted Gun should attract golfers from all over the region," said Clifton Frye, president of Mingo Logan Coal Company.



Once completed, it is anticipated that the course will be turned over to the Mingo County Redevelopment Authority or a similar public entity, which would then seek to find a suitable operator.

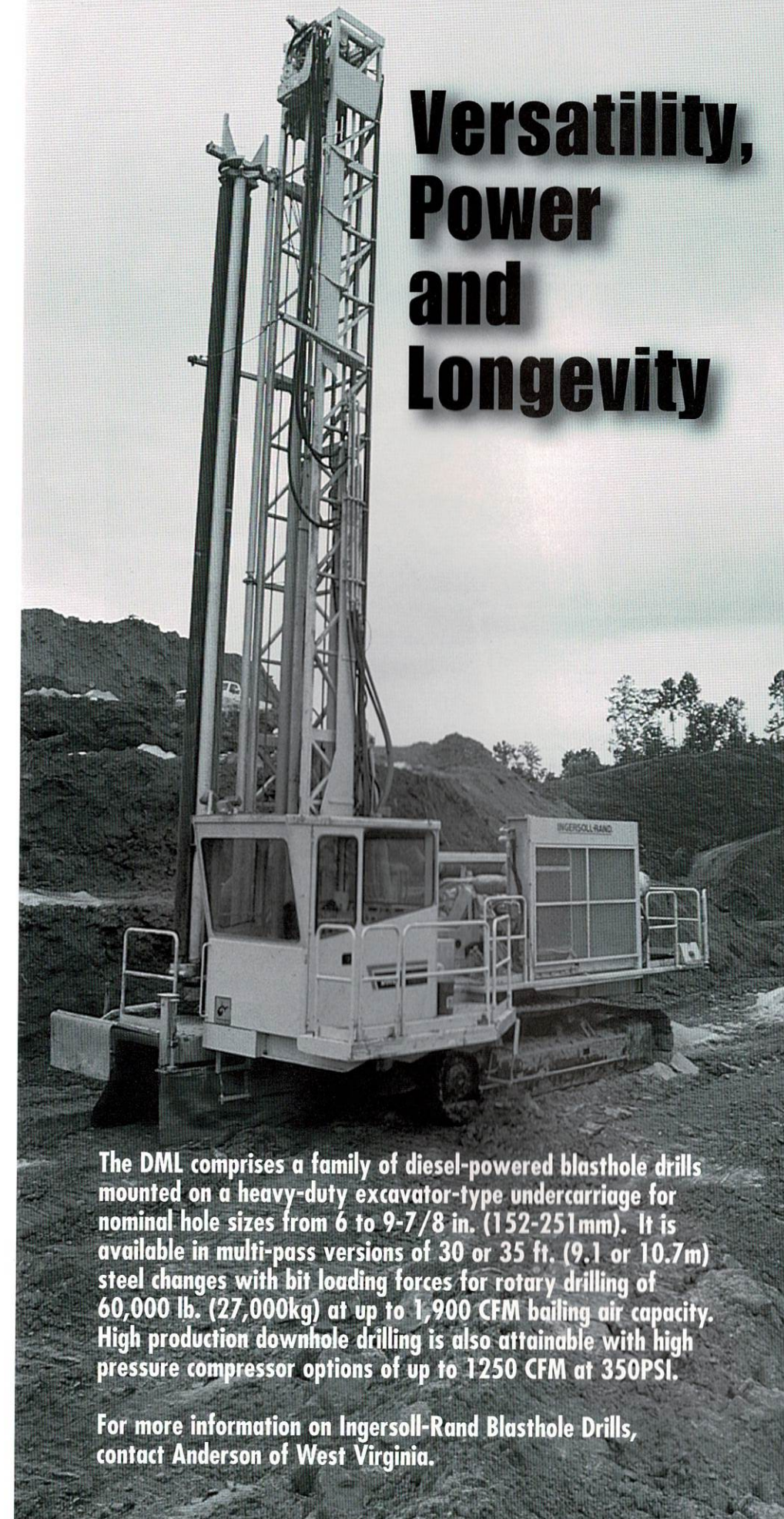
The course is scheduled to be completed in the fall of 2001 and will be open to the public.

(Continued on page 36)



(Above) An artist's drawing of the 18-hole Twisted Gun Golf Course, being built in Mingo County. (Left) (l-r) Danny Smith, Pocahontas Land Co.; Clifton Frye, Mingo Logan Coal Co.; West Virginia Governor Cecil Underwood; and Don Nicewonder, Premium Energy, pause for a moment in front of the future golf course after the ground breaking ceremony. The three companies formed a partnership to make the mountaintop mining operation a golf course as a post-mining land use.

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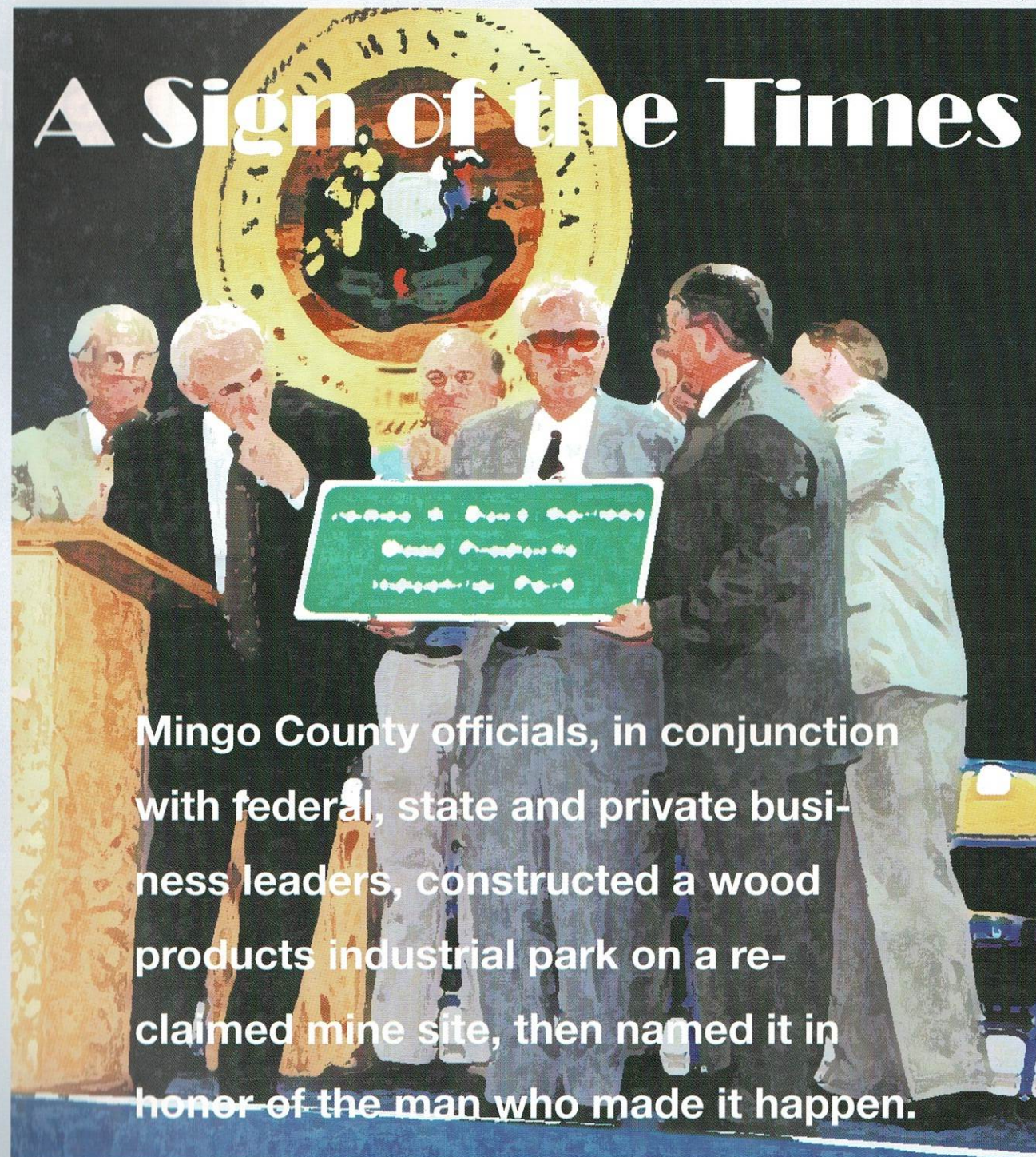
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A Sign of the Times



Mingo County officials, in conjunction with federal, state and private business leaders, constructed a wood products industrial park on a reclaimed mine site, then named it in honor of the man who made it happen.

West Virginia Governor Cecil Underwood, accompanied by several other state elected officials came to the Mingo County Wood Products Industrial Park to participate in the dedication on October 3rd. When all was said and done, the park became known as the “James H. ‘Buck’ Harless Wood Products Industrial Park,” after a great entrepreneur.

“I don’t think anything will ever take the place of coal,” said Mike Whitt executive director of the Mingo County Redevelopment Authority. “But, this is a step in the right direction to provide some jobs that, as coal plays out, we’ll have to offer our folks who are very skilled laborers in the mining industry who can be trained to work in the wood industry.”

A crowd of about 1,000 people, that were on hand for the official ribbon cutting ceremony, took up a very little space inside the building that stretched 82,000 square feet and is designed to be the hardwood flooring facility. They listened to Gov. Underwood, Harless and several others tell their own tales of how a dream became a reality.

The industrial park is located on a mountain-top mining site that was reclaimed by Arch Coal, at its Hobet 07 site. The official ground breaking ceremony was January 7, 1999 headed by

Mingo County Redevelopment Authority officials.

“It’s going to be a dry-kiln operation and a hardwood flooring manufacturing plant,” Whitt said. “It’s going to create approximately 100 jobs — 15 to 20 at the dry-kiln and somewhere around 75-80 at the hardwood flooring plant. We anticipate there will be 1,000 jobs in 10 years.”

Phase one of the project includes a centralized lumber storage area, lumber processing facility, lumber pre-drier, a battery of dry kilns, boiler and silo. The first shell building will house a hardwood flooring manufacturing and a second shell building will serve as a warehouse for kiln dried lumber.

When at full capacity, it estimated that the park will produce more than 10 million board feet of lumber every year with its 12 dry kilns. This will allow lumber companies to sell finished products to area businesses.

“You can’t accomplish anything without friends. These are my good friends and it’s easy to work together when you’re friends.”

James H. “Buck” Harless



Gov. Cecil Underwood cuts the ribbon for the James H. "Buck" Harless Wood Products Industrial Park during the dedication ceremony on October 3rd. On hand for the cutting were (l-r): Mike Whitt, Del. Harry

Keith White; Del. Steve Kominar; Senate President Earl Ray Tomblin, Gary White, James H. "Buck" Harless, Curt Fletcher, Gov. Cecil Underwood, Paul Gonzalez, Tom Talbot, and John Woolsey.

Officials of the MCRA purchased 680 acres from Georgia-Pacific, Cole and Crane and Ark Land Company.

Although MCRA officials said that the reclaimed site was selected due to the degree of the level land compared to any other site in the area there was still needed site prep before construction.

"We could have saved money if the company was allowed to keep the land flat when they were finished mining," Whitt said. "The cost of site prep for the entire area is projected at a half of a

million dollars."

The three limited liability corporations that partnered together with the MCRA to make this project possible were International Industries, Gilbert, W.Va.; Glen Oak Lumber, Montello, Wisc. and Columbia Forest Products, Portland, Ore.

Whitt said the wood products park is a start at diversifying the economy of southern West Virginia.

"The coal industry has been the backbone of everything that's happened in southern West

"The coal industry has been the backbone of everything that's happened in southern West Virginia, but it's not fair to them to carry the whole burden. I think it's our challenge to bring in other business."

Mike Whitt

Virginia — all our lives and our father's lives," he said. "It's not fair to them to carry the whole burden. I think it's our challenge to bring in other business."

The project was initiated by James H. "Buck" Harless who questioned years ago, why a furniture business could not be built in Mingo County.

The funding breakdown on the \$28 million industrial park is \$6 million in state and federal grants, \$8.6 million in conventional financing and \$13.4 million in private investments.

Tom Talbot, chairman of Glen Oak Lumber and Milling, Inc., of Wisconsin, recalled being asked six years ago to bring his company to West Virginia.

"Three years ago, we needed more flooring production, so I called Gary White to see if the offer still stood," Talbot said noting that there is about one million acres of forestland backing this facility, more than any other producer in the nation.

While guests spoke of the many hours spent to make this facility a reality, it was Harless, who received what can be called the greatest reward for his efforts, having the park named after him.

"You can't accomplish anything without friends," he said. "These are my good friends and it's easy to work together when you're friends."

Gov. Cecil H. Underwood described Harless as a hard working and successful businessman



Mike Whitt, (second from right) executive director of the Mingo County Redevelopment Authority presents James H. "Buck" Harless with a sign after the park was officially designated the James H. "Buck" Harless Industrial Park during the dedication ceremony. On hand for the official presentation were (l-r) Gov. Cecil Underwood, Dan Moore, Gary White, Harless, Whitt, and Curt Fletcher.

with whom he has had a long-standing and close friendship.

Many speakers that day gave credit and praise to Harless for also being the driving force behind the successful completion of the products park.

"For years I hounded Mr. Harless at every opportunity, asking him why we couldn't have this type of facility in the county," Whitt said. "Without him we wouldn't be here today celebrating this occasion."



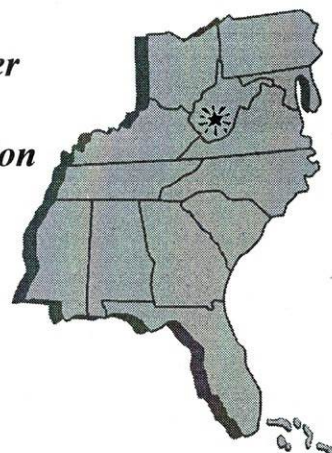
The James H. "Buck" Harless Wood Products Industrial Park was built on a mine site reclaimed by Arch Coal. The facility is expected to produce about 100 new additional jobs each year for the next 10 years.



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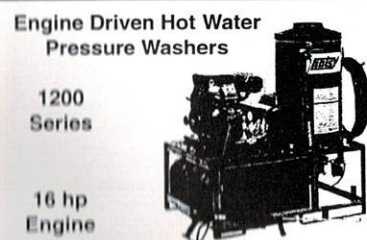
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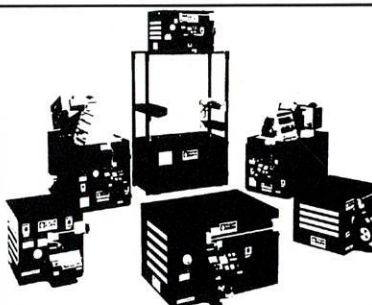
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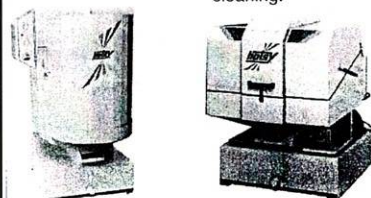
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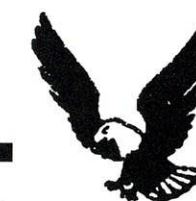


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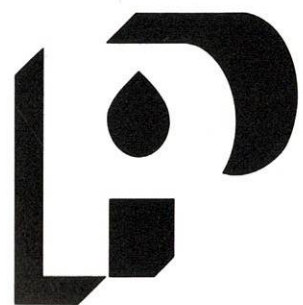
Twisted Gun Golf Course (from page 28)



Rain couldn't stop the ground breaking ceremony for the Twisted Gun Golf Course which is being constructed on a mountaintop mining site in Mingo County. In 1995, Mingo Logan Coal Co., Pocahontas Land Corp. and Premium Energy Corp. entered into an agreement to build the golf course once the coal has been removed from the site. The 18-hole course will

cover 230 acres and is scheduled for completion in fall of 2001. Pictured in the official ground-breaking are (l-r): John Rader, Terry Sammons, Danny Smith, Clifton Frye, Gov. Cecil Underwood, Del. Steve Kominar, Mike Castle, Senator Truman Chafin, Chief Justice Spike Maynard, Del. Harry Keith White, and Don Nicewonder.

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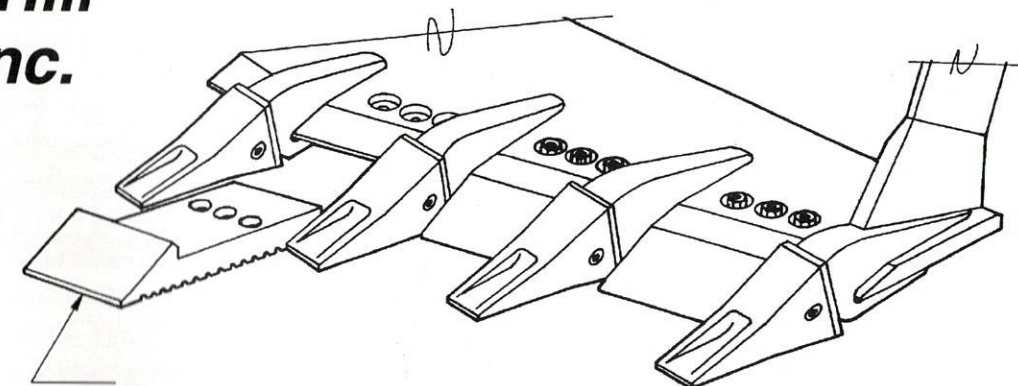
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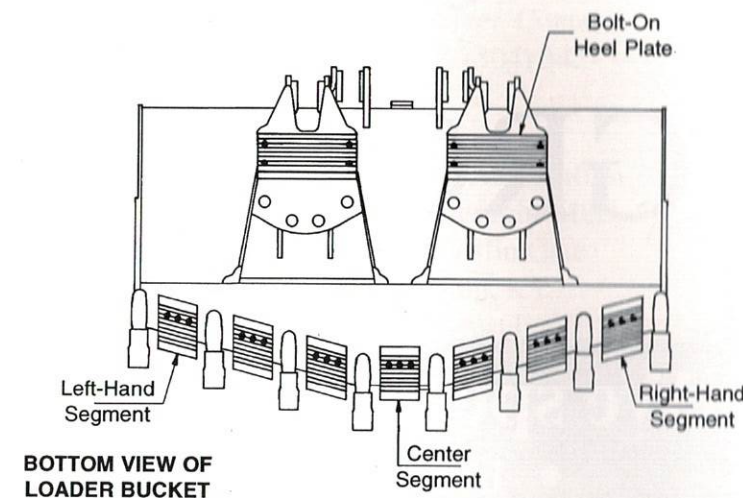
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992	6Y3610 or 6W0276	6Y3610HX



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Capelli (from page 6)

must attack these issues head-on.

"I don't think the general public is aware can't stress enough the value of sticking together as an association to combat the assault on our industry. We must, as a unified voice, work closely with our state and federal representatives on current issues. And, just as importantly, we must provide a factual, reasonable voice in the public arena that will help people make that connection."

Steve said that although he has watched coal prices drop year after year, he continues to remain optimistic about the industry.

"As far as I can see, there is no practical, economic alternatives to coal powered electricity," he said. "What else is there? Coal makes up 95 percent of the nation's fossil-fuel reserves," he said.

Steve and his wife, Carolyn, reside in Charleston and have two children, Greg and Amy.

Members Elected to WVMRA Board of Directors

Several members were newly elected to the WVMRA Board during the 34th Annual Meeting in White Sulphur Springs, on August 3-5.

Those elected to the board were Jim Campbell, Cabin Creek; Pat Graney, Charleston; Gary Patterson, Bickmore; and Tim Zeli, Charleston.

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Coal Calendar 2000

October

19 **Tug Valley Mining Institute Meeting**, Larry Joe Harless Center, Gilbert, WV. Speaker - Ben Greene, president West Virginia Mining and Reclamation Association. Call (304) 664-4006 for dinner reservations.

19-21 **West Virginia Coal Association Fall Membership Meeting** (WVU vs. Notre Dame) Lakeview Scanticon Resort & Conference Center. Contact: Sandi Davison, (304) 342-4153.

19-21 **Kentucky Coal Association Annual Membership Meeting**, Marriott Griffin Gate Resort, Lexington, KY. Contact Mike Musulin (606) 233-4743.

21-23 **Coal Laboratory Technician Training**, Western Kentucky University, Bowling Green, KY. Contact Geaunita Caylor (859) 257-2820.

30-31 **25th Annual (KY) Governor's Conference on the Environment**, Embassy Suites, Lexington, KY. Contact the NREP Cabinet at (502) 564-3350.

November

3-4 **West Virginia Mining and Reclamation Board of Directors Meeting**, Lakeview Scanticon Resort & Conference Center, Morgantown. Contact Patty Bruce (304) 346-5318.

14 **6th Annual West Virginia Economic Outlook Conference**, Charleston Marriott Hotel, Charleston. Contact Janet Lemunyon (304) 293-7831.

14-16 **Bat Conservation and Mining: A Technical Interactive Forum**, Airport Hilton, St. Louis, MO. Contact Kimery C. Vories, OSM, (618) 463-6463.

16-17 **Kentucky Mining Institute 61st Annual Meeting**, Lexington Center's Heritage Hall, Lexington, KY. Contact Geanita Caylor (606) 257-2820.

October

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November

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26	27	28	29	30		

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By:

**William J. Vail, Ph. D. President
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Since the beginning of coal mining in the Appalachian Mountains over 150 years ago, acid mine drainage (AMD) has had a major impact upon water quality of the streams. It is estimated that over 5,000 miles of streams are impacted in Pennsylvania alone.

Most AMD is caused by a natural occurring soil bacterium, *Thiobacillus ferrooxidans*, which oxidizes the sulfide in pyrites associated with bituminous coal to produce sulfuric acid. This acid extracts metals from the associated rock and clays to produce soluble metals such as iron, manganese, and aluminum in the water. The water also contains high amounts of sulfate, low pH, and high acidity.

There have been numerous attempts to remediate these pollutants. Most attempts have been made using chemical methods to neutralize the sulfuric acid. The addition of caustic or limestone decreases the acidity, raises the pH and precipitates the metals as hydroxides or carbonates. These methods require metering devices to add the alkaline substances, and are labor intensive.

Manganese, in particular, is difficult to remove since the hydroxide forms at a pH above 9.5 using caustic soda and neutralization is required before the water can be discharged back into the stream. The manganese hydroxide is collected in settling ponds and must be periodically taken to landfills. SAPS systems

or reaction with limestone don't effectively remove manganese.

Wetlands were found to remove some metals from AMD over 40 years ago. Man-made cattail wetlands were thought to be effective, if designed using mushroom compost.

It was first believed that the cattail plant removed the metal, but it was later realized that microorganisms, namely sulfate reducing bacteria found naturally growing anaerobically in the compost, produced hydrogen sulfide, which reacted with some of the metals. These sulfate reducing bacteria, mainly members of the genus *Desulfovibrio*, grew well and produced hydrogen sulfide during warm weather.

However, during cool to cold weather, their activity slowed and little H_2S was produced. Wetlands only work well in the warm months of the year. These wetlands do not remove manganese. One should note that if the compost of the wetlands should go aerobic, then naturally occurring *Thiobacillus ferrooxidans* would generate sulfuric acid and produce AMD from the metal sulfides in the wetland.

Ideally, the best technique to remediate AMD would be a microbiological system, which would regenerate itself. If the proper microorganisms are selected, they would adhere to limestone rocks, grow and be active over a wide temperature range in the pres-

ence of oxygen, and would be non pathogenic to animals or plants. In addition, if the bacteria would etch away small amounts of limestone as they grow and reproduce, the limestone would neutralize acids, reduce acidity, produce alkalinity, and raise the pH of the AMD. The Pyrolusite Process® is an ideal treatment that meets the above requirements.

Over the last 15 years, we have been interested in naturally occurring metal-oxidizing bacteria. These microorganisms may derive some of their energy by the oxidation of soluble metals to insoluble metal oxides. Some iron oxidizing bacteria are commonly found growing in streams impacted by AMD.

We obtained a sample of water in Somerset County, Pennsylvania early in the 1980's and found microorganisms in this water sample which could oxidize manganese to insoluble manganese dioxide. The isolation of these organisms was a difficult task. It was necessary to devise new culture techniques and new media to isolate and grow them in pure culture.

Once these isolation and culture techniques were perfected, manganese-oxidizing bacteria could be isolated and cultured from various waters and kept growing in a culture collection. Presently we have a culture collection of over 60 microorganisms that will oxidize iron, manganese, and aluminum under various environmental conditions.

Over the last eight years, we have applied the Pyrolusite Process® to AMD in sites in Pennsylvania, Maryland, and West Virginia. In every case, the microorganisms in the Process removed iron, manganese, and aluminum, eliminated acidity, increased alkalinity and pH of the water from each site and have continued abating these pollutants up to the present time. These sites now discharge water, which comply with EPA standards. In fact at a Buffalo Coal site in Maryland, there was

a release of bond by Maryland. There has been bond reduction in Pennsylvania when the Pyrolusite Process® has been employed.

In some of our early experiments, we tried to inoculate microorganisms into wetlands, hoping to establish a population of these microorganisms. There is a fundamental law of ecology; however, two organisms cannot occupy the same spot in an ecosystem at the same time. The organisms we introduced into the wetland would have to occupy sites already occupied by other microorganisms, such as other bacteria, fungi, algae, and protozoans.

We realized that it would be necessary for us to design a new ecosystem for new sites for our microorganisms to occupy. We had experimented with a limestone system in the laboratory and found that the metal oxidizing bacteria would adhere to the surface of limestone. We discovered that, during their growth and metabolic processes, the microbes etch away small amounts of limestone, which dissolved into the water. The dissolved limestone decreases acidity, increases alkalinity, and raises the pH of the water.

In another laboratory study we wanted to determine what growth substances would be necessary to maintain the population and activity of these microorganisms. We tested two waters from the same seep. First we took a water sample directly from the seep as it arose from a rock outcrop. The second water sample we took from the end of a man-made wetland into which the first seep water ran. A laboratory study was undertaken on both waters. We had first seep water itself, then seep water plus limestone, and then seep water plus limestone plus microorganisms in each of three reaction vessels.

The other conditions were also in three separate reaction vessels. They were wetland water by itself, wetland water plus limestone,

and finally wetland water plus limestone plus microorganisms. To all six containers we added manganese to achieve the same manganese level of 75 mg/L. We sampled each bucket every two hours and determined the manganese concentration. Figure 1 shows the results of this experiment.

As it can be seen from Figure 1, water alone had really no effect upon the removal of manganese from the level of 75 mg/L. There is a modest reduction of manganese with the water plus limestone. This reduction can be attributed to manganese adsorbed on sites on the surface of limestone. Once these adsorption sites have been occupied, then there was no additional removal.

However, when water plus limestone plus microorganisms were used, there was a marked reduction in the manganese level in the water. This reduction kept up until we ended the experiment after 24 hours.

Comparing seep and wetland water with limestone and microorganisms, a legal EPA standard of 2 mg/L was achieved at 16 hours for the wetland water, limestone, and microorganisms. The comparable seep water was still falling and probably would achieve legality in about 48 hours.

It could also be seen that there were some substances derived from the wetland that stimulated manganese removal as compared to nutrient-free seep water. Remember that both the seep water and wetland water came from the same seep. We think that there are some nutrients produced from decomposition of vegetation or from the composted mushroom manure in the sediment in the wetland that stimulated the microbes to remove manganese.

Also notice that there is a different point at zero time on the y-axis. There is a lag time from the time we took the sample and ran the

manganese. During this lag time there was significant manganese removal, especially when the sample contained manganese, limestone, and microorganisms.

From these and other laboratory experiments, we determined that the optimum conditions for manganese removal by our mixture of microorganisms would be to establish a treatment bed lined with a polyethylene liner, filled with limestone and water, and then inoculated with a specific mixture of metal oxidizing bacteria. This bed should be preceded by a wetland.

To achieve optimum metal removal, the size of the bed should be such size to give the AMD a 3-day retention time. To give the best alkalinity, the limestone should be at least 87% CaCO_3 equivalence. The limestone should cover the surface of the water at least 1 foot in depth to eliminate light to the water, preventing the growth of algae. A liner is used for two reasons: to segregate the water and metal oxidizing bacteria from competing microorganisms in the soil, and in the case of drought, keep the bed with its microorganism hydrated.

To evaluate a particular site, we require two years of flow data so that we can determine the size of the treatment bed. We like to design a treatment bed, which will emit water in compliance to EPA standards 12 months of the year. On this account, we believe it is folly to use average flows; instead we design the bed for peak flows. We also require test results of metal loading data submitted to state regulatory agencies, to determine the metal loading of the seep over the 12 months period.

We take a water sample of the particular seep or seeps, which will represent the total metal loading that will be treated. In our laboratory we select particular isolates of microorganisms from our culture collection which

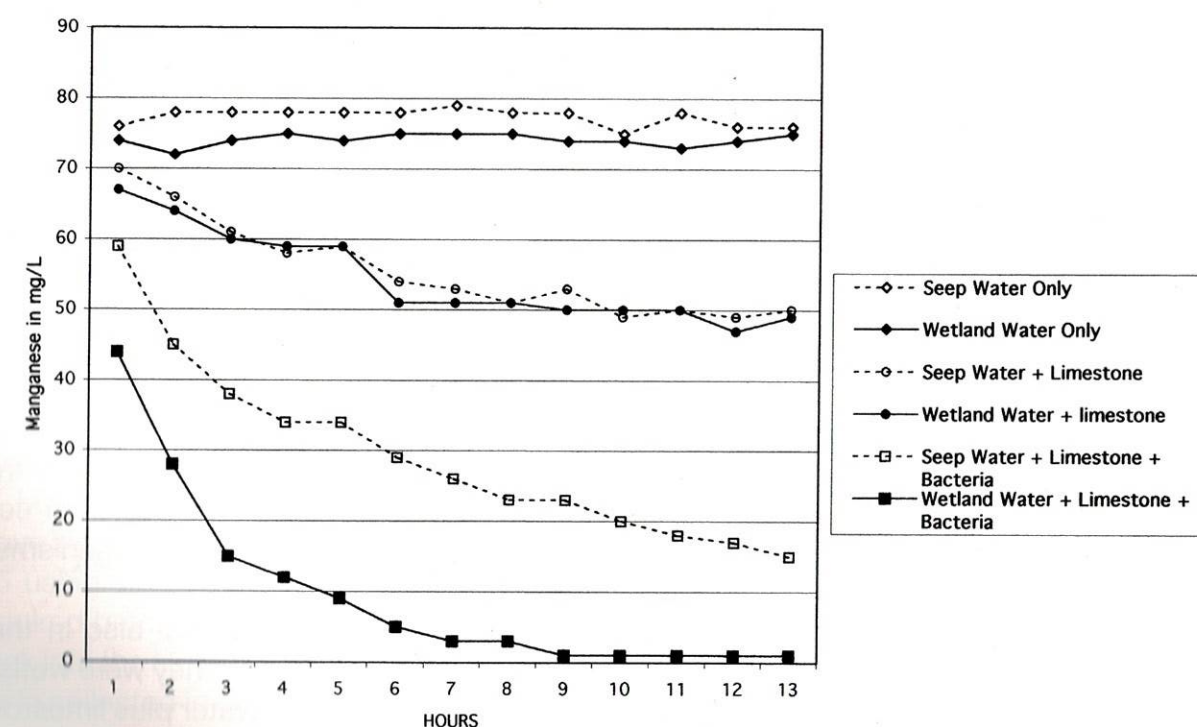
will grow, reproduce, and quickly reduce the metal loading of the water sample. Once the particular mixture of microorganisms to be used have been selected, larger amounts of seep water and limestone from the quarry that will be used for the treatment bed will be collected. These materials will be transported to our laboratory and inoculum will be cultured to inoculate the treatment bed for that and only that particular seep. We don't leave anything to chance. If the organisms are matched to the specific seep water and limestone, we can be assured that the inoculated treatment bed will be successful. It usually takes a minimum time of about 3 months to accomplish the selection and culture of the inoculum.

It is generally a good idea to construct and plant a small wetland to service the treatment bed the year preceding the construction of the treatment bed. This time interval will allow all the bacteria from the mushroom compost used in the wetland to be washed out. If good preplanning is used, time will be available for the preparation of inoculum.

Once the treatment bed is constructed, limestone added and filled with water, then both solid inoculum (bacteria coating limestone grown in the laboratory) and liquid inoculum of bacteria are added.

There is a specific window of opportunity for inoculation of the treatment bed. Since we are dealing with living bacteria, these organisms are temperature sensitive for their growth and spread. Warm water temperatures encourage the rapid growth and development of these microorganisms. The longer the period of warm water temperature, which is reflected by the ambient air temperature, the better growth, spread, and colonization of limestone will occur. So to achieve maximum growth, spread, and colonization, early May or early June is optimum for inoculation.

Figure 1 EFFECT OF WATER TYPE, LIMESTONE, AND BACTERIA UPON REMOVAL OF MANGANESE



The following graphs represent data taken from a single site, the Wilson Tipple site of Buffalo Coal Co. representing AMD coming from coal refuse. This site was inoculated in 1992 and has performed well since that time. In fact, the State of Maryland has released the bond at this site. One site in Pennsylvania using the Pyrolusite Process® has had a reduction of bond by Pennsylvania Department of Environmental Protection. It can be seen from Figure 2 for that for over a three-year period iron was effectively removed from this AMD and the iron effluent never exceeded the EPA iron standard. Note that the y-axis is log [Iron]. In most cases the iron was reduced to between 0.1 and 1.0 mg/L.

Figure 3 represents the removal of manganese and is represented as log [Manganese] in the figure. There was a sampling error dur-

ing the first year of sampling. Instead of sampling directly at the outlet of the treatment bed, the technician sampled at a site 20 feet below the outlet of the bed. Between the outlet of the bed and the sampling site, another seep, which contained about 8 mg/L manganese, joined the effluent from the bed. We found this sampling error, ditched the seep to the top of the treatment bed and the treatment bed successfully removed the manganese and produced effluent below the EPA standard.

During the growth process, the bacteria inoculated into the treatment bed adhere to the surface of the limestone. As the bacteria grow, they etch away small amounts of the calcium carbonate, which dissolves in the water of the AMD. Results in an increase in alkalinity with a concomitant elimination of

Figure 2 REMOVAL OF IRON BY THE PYROLUSITE PROCESS® AT THE WILSON TIPPLE SITE

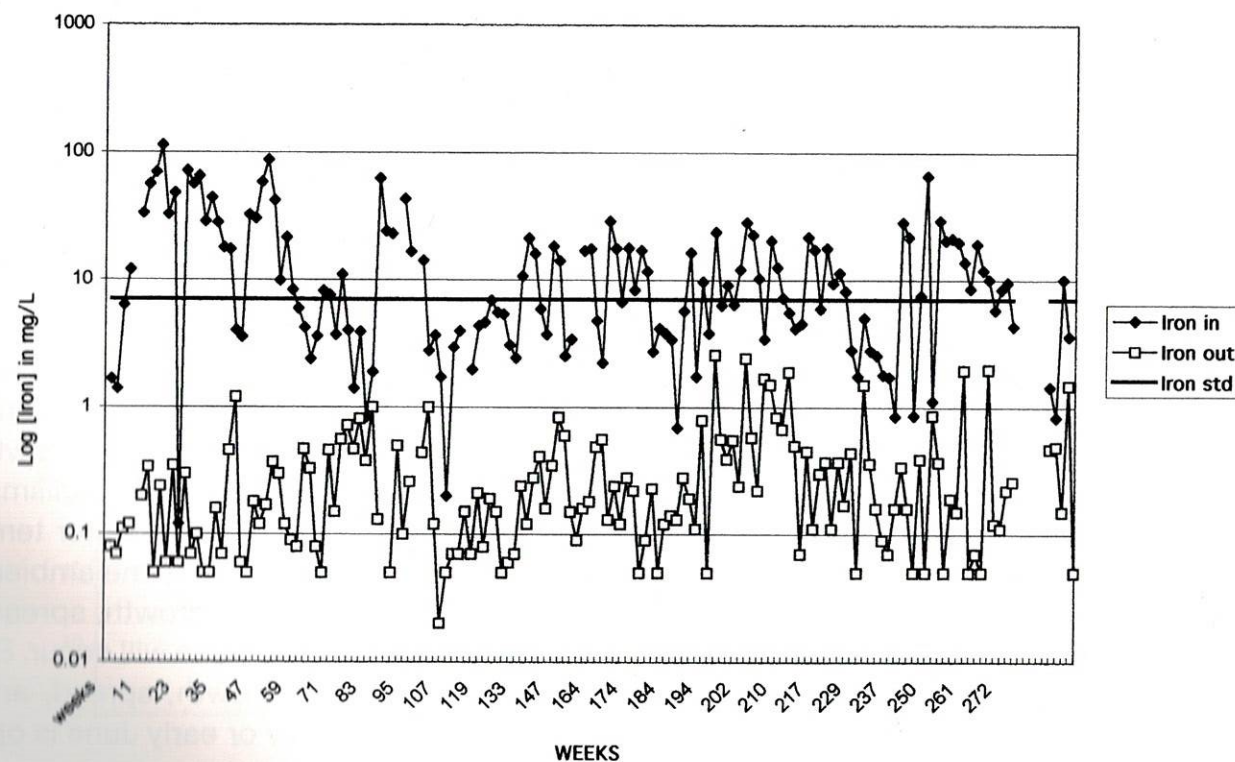


Figure 3 REMOVAL OF MANGANESE BY THE PYROLUSITE PROCESS® AT THE WILSON TIPPLE SITE

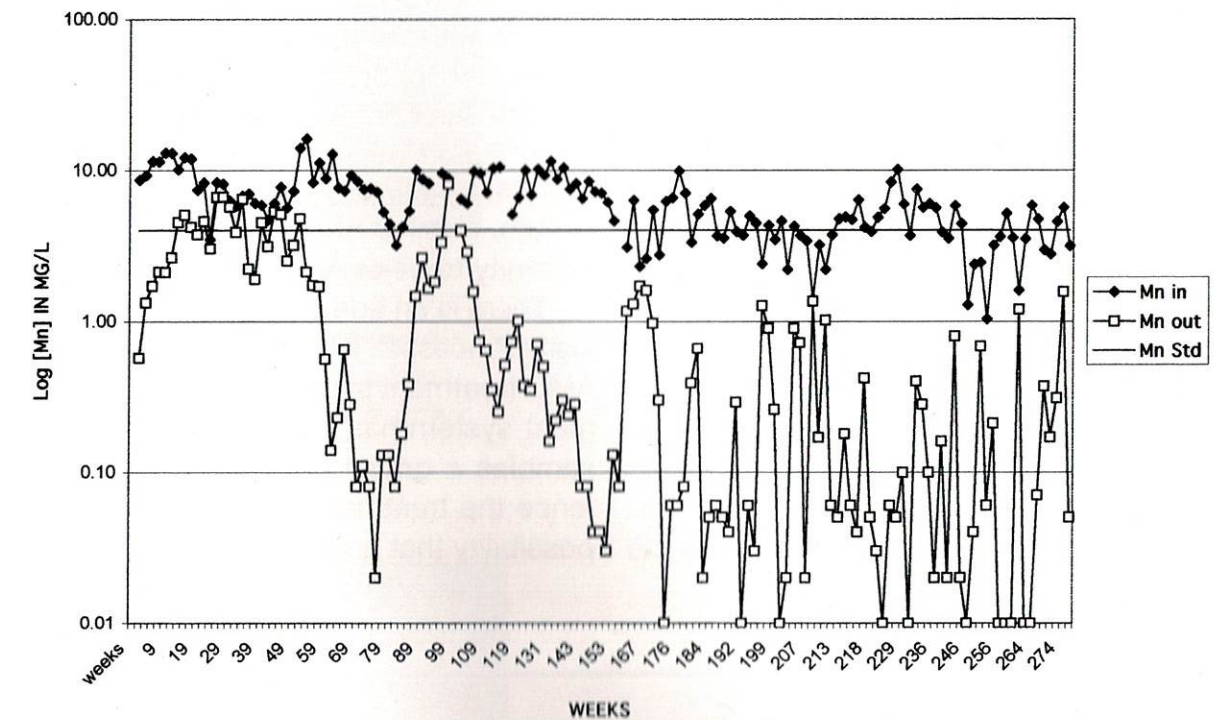
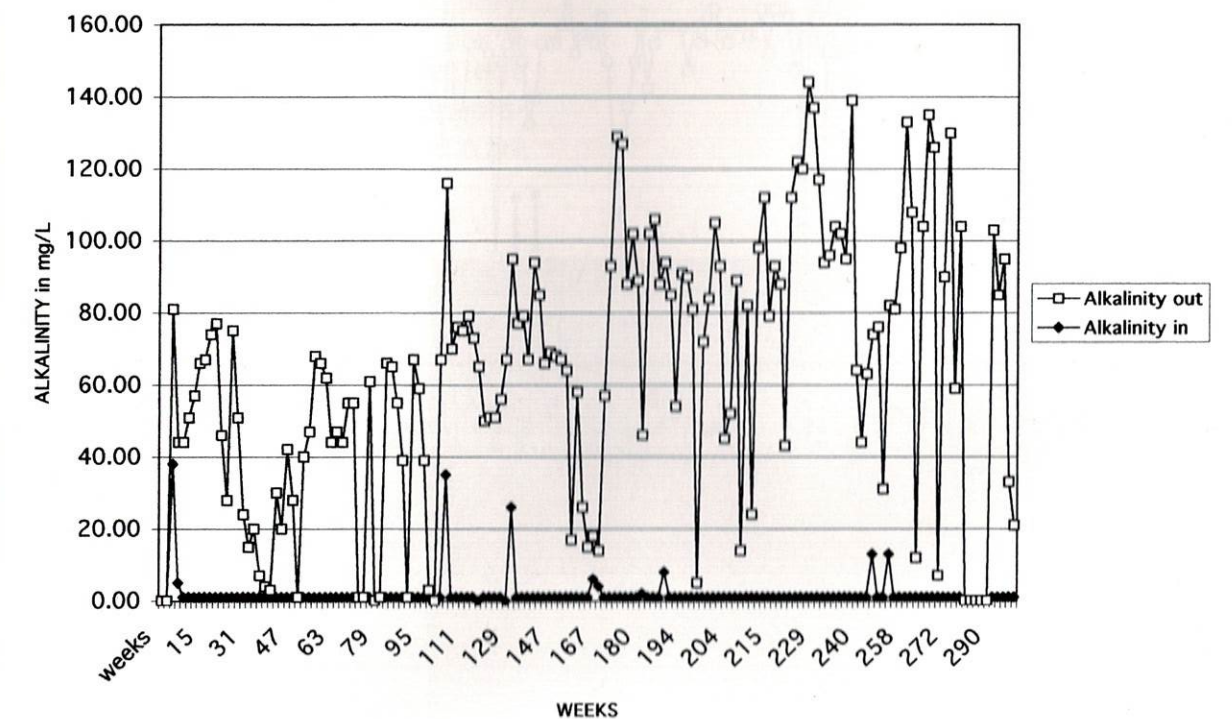


Figure 4 ADDITION OF ALKALINITY BY THE PYROLUSITE PROCESS® AT THE WILSON TIPPLE SITE



acidity as can be seen from Figure 4. In some cases, at the effluent from the bed calcium sulfate precipitate can be observed.

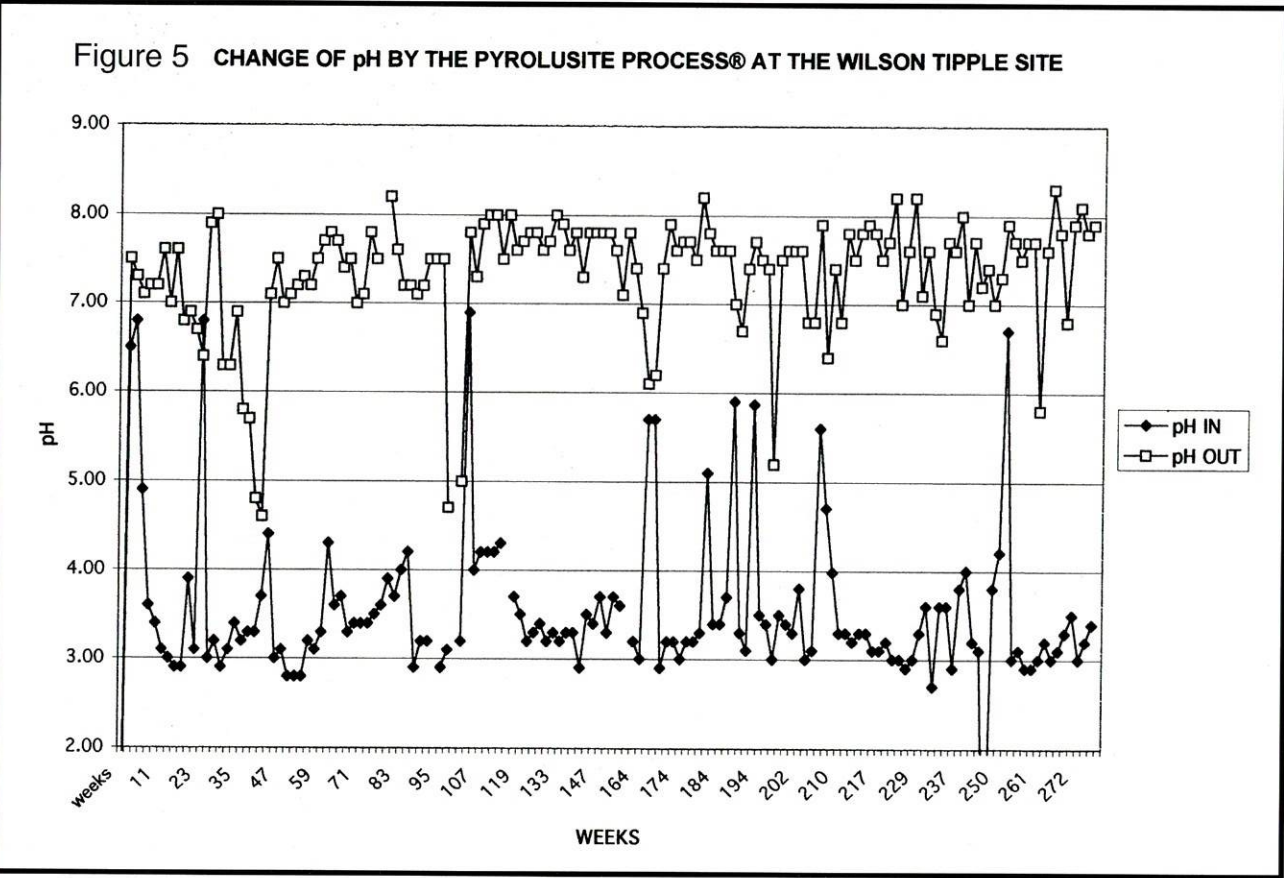
As with the increase in alkalinity, there is a change in pH of the AMD (Figure 5). The calcium carbonate neutralizes the acids and the pH is usually above pH 7 in the effluent water. In cases where the pH is lower than 7, there are unusually high flows from the seep during winter snowmelts or high rain. The Wilson Tipple site was the second site employing this bioremediation process. Beds are now designed larger to accommodate high flow events.

At the Wilson Tipple site, the AMD contained about 15 mg/L aluminum, but due to the resulting high pH, the aluminum precipitated as the

insoluble aluminum hydroxide. This precipitation usually occurs above pH 4.6.

Presently, we have 11 sites in operation and six additional sites under construction and awaiting inoculation. We anticipate similar results for these six additional sites. The first site was inoculated in May 1991 and has successfully removed manganese, iron, aluminum, eliminated acidity, increased pH and alkalinity to below EPA standards.

There is an additional feature of the Pyrolusite Process®, which make it unique among AMD treatment systems. A completed treatment system has no standing water but resembles a gravel pile. There is no need to fence the treatment system and there is no possibility that an intruder might drown.



The optimum conditions for manganese removal by our mixture of microorganisms would be to establish a treatment bed lined with a polyethylene liner.



To achieve optimum metal removal, the size of the bed should be such size to give the AMD a 3-day retention time.



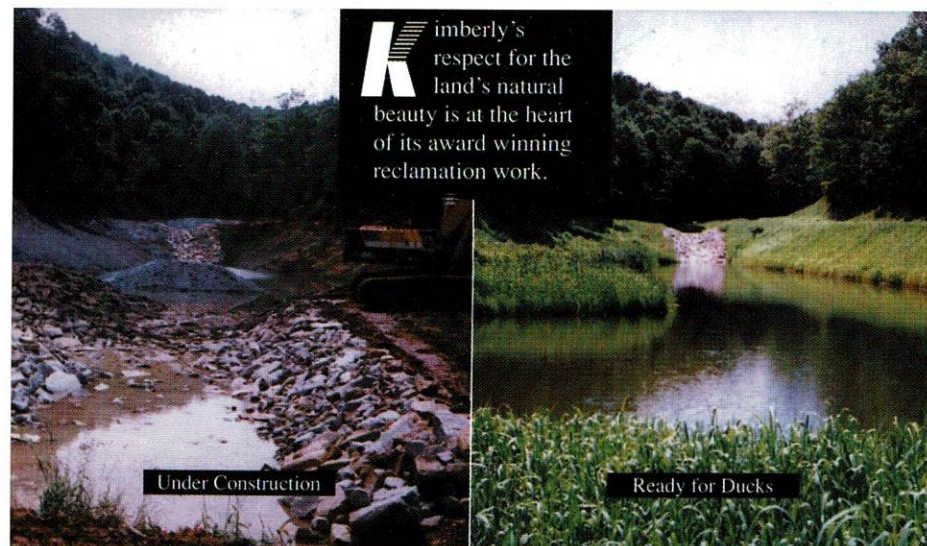
Once the treatment bed is constructed, limestone added and filled with water, then both solid inoculum (bacteria coating limestone grown in the laboratory) and liquid inoculum of bacteria are added.



Water draining into the treatment bed.



Water quality in a constructed wetland has been greatly improved after the treatment.



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