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On the Cover A teacher at one of the TMRA Teacher Workshops.
During the summer months, while many of us were enjoying a bit of a well-deserved break, some lucky teachers chose to spend their summer vacations participating in a week-long opportunity to learn about mining and reclamation in Texas.

TMRA and participating mining operations have been hosting the Teacher Workshops for over 20 years now. These five day events are truly ‘workshops,’ as the teachers are working and learning all about geology, mining, land restoration and the importance of minerals, such as lignite and uranium, are to our society.

The hand-selected teachers fulfill training requirements in actual mine and classroom-type settings. They get to tour mining operations, because, what better way to learn than to actually be on site to see what is really going on, ask questions from mining personnel, and be able to take rock and lignite samples back to the classroom to share with their students. It really is a “hands on” learning experience.

In recent months, TMRA's Teacher Workshops received positive press coverage in several newspapers around our state. One included a picture of a local teacher standing next to a large mining truck (the tires being about twice the height of the teacher), and another article included a photo of the workshop class of about 20 teachers standing in a dragline bucket. Receiving this type of media coverage helps raise awareness about mining, helps us recruit new teachers, and helps spread the word about great jobs in this field.

The best part about the workshops is that they are free to the teachers, with meals, lodging and all class materials provided. How do we do this, you ask? It is simple – the mining companies and their suppliers donate and raise money every year just for these workshops because we know how important mining is to Texas, and we want to share that story with others.

I can’t say enough about the workshops; we believe they offer so many positive benefits for the teachers, their students and communities. If you know a science teacher in your child's school whom you think might benefit from this type of workshop, please have them visit our TMRA website at www.tmra.com and click on the Teacher Workshop link on the bottom left hand side for more information.

Now it is time for me to pass the torch to TMRA’s new Chairman, Greg Shurbet, someone whom I know sees the tremendous opportunity that lies in TMRA’s education program.

Steve Eckert
TMRA Chairman
2012
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As I pen this column, we have just concluded the 37th TMRA Annual Meeting in San Antonio. The winter issue of Texas Mining will provide a full recap, but suffice it to say, it was one for the record books! Each measure used to gauge success (total registrations, auction income, exhibitor numbers, etc.) was up significantly. If you were there, thank you! If not, plan now to attend next October at the Hyatt Lost Pines in Bastrop.

The annual budget for 2013 has been approved, and we are preparing now for a great year ahead. In the near future, you will see vast improvements to the TMRA website (www.tmra.com), a reenergized membership committee, and significant public relations and outreach efforts. TMRA members and the mining industry in general have a great story to tell. Whether that is employment, economic impact, taxes paid, energy produced or land stewardship, we can proactively make these issues the headline and the “story.” It is a choice whether to be proactive or reactive with regard to how the general public views our industry(ies).

Nowhere is this more evident than in the TMRA education program and the Teacher Workshops. This is where TMRA members put their money where their mouths are! Proceeds from the annual meeting auctions fund what is known as the top mining industry education program in the nation. As Education Director Francye Hutchins points out in her article, we have reached more than 800 teachers and over 1 million Texas students who now have a better understanding and appreciation of mining and reclamation. Hats off to you contributing members, and to YOU Francye!

Finally, the transition to the new TMRA Executive Committee has begun. After “breaking me in” for a year and a half, Steve Eckert (Capital Aggregates) moves from chairman to immediate past chairman. Greg Shurbet (AEP) has assumed his role as chairman and Peter Luthiger (Mes-teña Uranium) as vice chairman. Congratulations to Mike Altavilla (Texas Westmoreland Coal Company) who was elected as our new treasurer, and to Chris Sumner (Lhoist North America) who was elected as the new secretary. Special thanks to Mike Kezar as he ends a six-year executive committee run of keeping a close eye on the details, and to Phil Berry who (as you read this) has left Texas for greener pastures in the Florida mining world. You will both be missed.

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TMRA’s Commitment to Education

In 1990, Texas Mining and Reclamation Association (TMRA) made a commitment to furthering earth science education in Texas schools. The cornerstone of this commitment is TMRA’s “Resources and the Environment” summer workshops for teachers. The purpose of these workshops is to improve the quality and effectiveness of earth science education as well as to promote an understanding of the balance between the need to develop our natural resources and a commitment to the environment. Furthermore, TMRA wishes to encourage vocational and professional career choices in earth sciences and related fields, demonstrating the value of mining to the Texas economy and lifestyle, and enhance the mining industry’s public image.

History of the Development of “Resources and the Environment”

The idea to develop an Earth Science curriculum that would integrate mining and reclamation was the brainchild of Dick Robinson, Director of Community Affairs, Phillips Petroleum Company, and James A. Luppens, Chief Geologist, Phillips Coal Company.

In 1991, a grant from the Phillips Petroleum Company to the Center for Engineering Geosciences at Texas A&M University provided the financial support to develop curriculum. This was a collaborative effort between Dr. Christopher C. Mathewson, Director of the Center for Engineering Geosciences and Professor of Geology at Texas A&M University; his research assistant, Mr. Donald B. Riley; Dr. Deborah D. Bendler, APR, of Wallis Gideon Wallis, Inc., a communications consulting firm in Tulsa, Oklahoma; and Jim Luppens, Phillips Coal Company, who provided the crucial “real world” perspective for the curriculum.

Each curriculum unit is designed to give students an opportunity to learn about earth science and apply their knowledge to a real problem. The unifying theme is the
tendees tour clay pits, brick plants, and an aggregate pit and learn how those “rocks” are used to make concrete and hot mix.

**An Award-Winning Program**

The TMRA education program has become a model for energy, environmental and natural resources education in Texas. TMRA’s program has received numerous awards and recognitions:

- Recognized by the Governor’s Office at the Governor’s Conference on Math, Science and Technology, July 1998.
- Received the Texas Railroad Commission’s Certificate of Merit for Energy Education Programs, September, 1998.
- Certified by the Texas Environmental Education Advisory Council (for Texas Education Agency).
- Received the National Mining Association’s Award of Excellence in Education, 1998.
- Received the Texas Mining and Reclamation Week certificate from the Governor’s office 1998 – 2003.

The application of the TMRA program in the classroom has been videotaped and broadcast statewide by the Texas Education Agency (TEA). The recognition of our program by the TEA, Texas Railroad Commission and the Governor’s office has increased statewide visibility.

TMRA will continue to keep education a top priority and will support the further development and distribution of this curriculum, not only through financial resources, but with the time and talents of its membership.

**Teach a Few, Reach Many**

Since its beginning in 1991, more than 800 teachers have attended the workshop. And each teacher will reach approximately 130-150 students annually. We estimate that over one million students have heard the true story of mining and reclamation!

**Aligning Curriculum with State Requirements**

Texas education requirements, Texas Essential Knowledge and Skills (TEKS) and the corresponding State of Texas Assessments of Academic Readiness (STAAR) have created subjects to be taught that many teachers haven’t taught before or even taken. TMRA’s “Resources and the Environment” meets the majority of the new state education standards for Earth Science through all grade levels and provides a place for teachers to get first-hand knowledge of how natural resources in our state are developed and used.

**Expanding Curriculum with New Workshops**

In 2008, TMRA, with the support of the TMRA Uranium Committee, added a workshop based on uranium mining. Teachers attending this workshop tour an operating uranium mine and a nuclear power plant. As with the coal workshops, teachers learn about the importance of responsible mining of a valuable natural resource and how that resource is used to provide affordable electricity. All the activities are classroom ready and correlated to the TEKS and STAAR tests.

In 2009, TMRA initiated another summer workshop, this one based on the mining and use of clays and aggregates. Teachers tour clay pits, brick plants, and an aggregate pit and learn how those “rocks” are used to make concrete and hot mix.

- Certified as professional development provider by the State Board of Education Certification (SBEC).

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As a recycling, tree hugging, “carbon market” supporting, Environmental Science public school teacher, I was chosen to participate in the Texas Mining and Reclamation Association sponsored coal camp and had the privilege of visiting Westmoreland Coal’s Jewett Mine. Before my experiences at camp, this is what I knew or thought I knew about mining and coal:

- A large percentage of energy generation in Texas is coal-fired.
- Coal used in power production comes from out of state.
- The coal industry has a poor worker safety record nationally and worldwide.
- China is the world’s largest producer of coal.
- China produces large amounts of SO₂’s, NOₓ’s and mercury in their coal fired power plants, unlike the U.S.

Ronald Reagan (I voted for him) helped control the acid rain problem by utilizing the market forces of “Cap and Trade.”

Some of my views of strip mining were formed when I was an undergraduate at the University of Missouri (class of ’77), when my friends and I went to the reclaimed lead strip mines, which had been donated to the state, to play on the mine dumps – we would slide water park-style into the abandoned tailing ponds. We would go back to our dorms covered in mud and clay, our skin stained by the water in the ponds. Did I mention that I graduated in 1977?

The other experience that hardened my heart against the coal industry was driving through West Virginia and seeing the billboards championing attempts to stop the Environmental Protection Agency. Part of President Richard Nixon’s legacy (I voted for him in 1972) is the formation of the EPA, which began operations on December 2, 1970 (I am not saying, however, that every regulation the EPA comes up with is well conceived.). This was my mindset prior to attending the TMRA Teacher Workshop, an experience upon which I will always look fondly.

Now, it’s time for a pop quiz – remember, I am a teacher. So what happened in 1977 that affected the mining industry? If you answered the Surface Mining Control and Reclamation Act of 1977 (SMCRA), you’re right – go to the head of the class! SMCRA was passed and became federal law in 1977. This began the changes we are seeing today.

So now I will tell you why some of my views changed during the week I spent at Wes. I carpooleled (here I go again - a tree hugger carpooling, trying to save the earth) to the hotel with another teacher. On Sunday night, I checked into my room, had a meet and greet with the other teachers, and enjoyed a great meal. Bright and early the next morning, we carpooled to the Jewett Mine, had our safety training, and received our personal safety protection goggles, vests and hard hats. We were like kids as we decorated...
our hard hats with all the stickers Francye Hutchins, TMRA’s Education Director, had given us. If you ask Francye how she keeps 20 teachers happy, she will tell you, “Feed them well and have a pocket full of freebies – you can even give them rocks,” and she did just that! We received both coal and core samples.

The in-class part of the training was well-run and highly informative. We began with a test on our then current knowledge of coal (wait! I am the teacher – I should be on the other end of the test!). Later we had our first lesson on coal, its makeup and many uses, and looked at all aspects of the Texas surface mining and energy production industry. We learned about site preparation and permitting, and environmental impact as well as associated topics including anthropology and archeology, and even landowner contract negotiation.

As an added benefit, the Railroad Commission of Texas (RCT) inspector who was onsite came over to talk to us and share some of his views. We also looked at Westmoreland’s record of compliance with Mine Safety and Health Administration (MSHA) and RCT rules, including the results of government inspections. I was truly impressed by their safety record, and it is my hope that all TMRA members have the same priority to worker safety as Westmoreland Coal.

Mid-week, we were ready for the field trip to NRG’s Electrical Power Station. We began with our safety training, more free stuff, and a great lecture by Mr. John Fry on “how a power plant works”. I learned a great deal during that presentation, which helped me take my classroom energy production unit to a whole new level.

I found the powdering of the coal before burning it and the path of the steam passing through the turbine three times (and through a different size turbine blade each time) very interesting, and that extracting every possible BTU out of a ton of coal is good for a company’s bottom line and also good for our global carbon footprint.

I noticed the control room looked just like the control room of the polystyrene plant on the Houston ship channel I toured in 2011 with the Science Teachers
and Industry (STI) program conducted by the Texas Chemical Council. What I wasn’t prepared for was the size of the twin turbines. Given the size of the power plant, I had always thought the turbines would be much larger, but was quite surprised to learn that both turbines could fit on one floor of one large room!

During the remainder of the week, we participated in many hands-on labs, which we have taken back to our classrooms. Francye did a great job meeting all the needs of the elementary, middle and high school teachers – quite a challenge!

Finally, the time we had all been waiting for – recess! It was time to go play outside, dig in the dirt (coal pile, I mean) and climb on all the equipment. Even though we had been told about the magnitude of the landscape, we weren’t completely ready for seeing an actual coal mine for the first time – it was immense!

Our tour began in one of the pits where the coal was being loaded. The operator loading the coal hauler dropped a scoop in front of us. We were trying to figure out why he had done this, when our tour guides told us to collect our samples. We were on it like ants at a picnic – you could see the operator in the cab just shaking his head. Can you blame us? After a few more stops to view the plant from the rim, we ended up at a dragline, which wasn’t in use. We were able to get the full benefit of the tour by climbing into the dragline. And of course, we got our class picture in the scoop, with ten people across and two deep. Following that, we went back to the office for lunch.

I loved everything about the tour; but the last day at the mine highlighted my reason for coming. I was most interested in the reclamation aspect of surface mining. Sustainability is a major focus of any AP Environmental Science class, and in light of my college experience with Missouri surface mines, I wanted to see firsthand where the mining industry is today. After a soils lecture from Dr. Sam Feagley, TAMU, it was back outside to tour additional sites, which were in different stages of reclamation.

I am pleased to say that when standing in a reclaimed mine area, I could not tell the difference between native, undisturbed pastures and pasture in the final stage of reclamation. This particular area is very near to being returned to the landowner. It wasn’t until we looked at the layers of the undisturbed soil and the reclaimed soil structure that we could distinguish between the two. That was impressive!

So, what am I doing with this new knowledge now that I’ve attended camp? It definitely has a place in my classroom. BCC (before coal camp), my energy production unit was illustrated by a series of rectangles – burning the coal was a rectangle on a flow chart with an arrow pointing to the “turn the water into steam” rectangle, but it now seems much more real. I try to communicate the sights, sound and feel of a working power plant.

And as an educator, I attempt to teach both sides of complex issues. In one of my classes I showed my students pictures of our group in the coal pit, but after some explanation, a few students were saying, “We shouldn’t let them do that.” We discussed why that might be, and I spoke about available energy alternatives such as nuclear, solar and wind power. I reminded them about our school district turning off the building air conditioning in early September because of such high area usage. The district had agreed to do this for a discount on our bill. I told them that 40% of energy comes from coal-fired power plants so, if we shut down every coal plant tomorrow, we would have to turn off the power somewhere. What parts of the day do they not want light and air conditioning? Then I hit them where it hurts – when do they want to turn off their video games? Some students are convinced of our need for coal, a few will say we should get the coal somewhere else (not in my backyard, though) and others still say “no, we should not let THEM do this – there should be a law.” I told them there is a law: the Surface Mining Control and Reclamation Act of 1977, and I pulled up pictures taken of the reclaimed area of the Westmoreland Mine. We are about to start our environmental law section tracing the history of the United States law and international treaties. I am using Westmoreland’s exemplary record in compliance with RCT and MSHA, telling my students this is how they should judge a company – by its concerns for its workers and the public. I now believe that in Texas, the mining industry gets it right and should be a model for the rest of the country. I have also been able to “play it forward” presenting with Mike Ratz (Coal camp 2011) to a group of advanced environmental science teachers at one of the two in-service meetings I host each year.

Texas public education and Texas surface mining have a lot in common. I think both are doing good jobs but our detractors think we can’t find our backside with both hands. Public education in Texas is reducing dropout rates, requiring more years of math and science (now 4 years) and implementing more rigorous testing requirements for graduation. The Texas surface mining companies are doing a good job on site protection during extraction and land reclamation. The Texas power plants are squeezing the last kilowatt from a ton of coal while reducing SO₂, NOₓ and CO² emissions. The people of Texas will not let us rest; wanting the best for themselves and families will continue to raise the bar in both industry and education. I believe we are up to the challenge because the coal miners, plant operators and educators are also Texans.

When meeting someone new, I always ask about their job and whether it might be a good career for my high school students. I ask two questions of nurses and medical technicians at my doctor’s office, chemical plant operators on the ship channel and wind technicians servicing large wind mills: What education is necessary? Is there a future in their field? Before the coal camp experience I would not have recommended working at a mine. The messages I got loud and clear at the TMRA sponsored coal camp is that the coal industry has safe, good paying jobs for men and women with all levels of education. I will tell my students to check out the opportunities the industry has if their football/Rap career doesn’t work out.

I ask that you don’t shake your head, roll your eyes and say, “OH, you’re one of them!” The next time you meet an environmental science teacher remember that we are scientists too, and all we want are the facts!
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Texas Teachers Participate in Coal Mining Workshop at the Texas Westmoreland Coal Company’s Jewett Mine
June 24 – 29
Jewett, Texas

Highlights of the workshop included tours of the Jewett Mine, NRG’s Limestone Electric Generating Station, and reclaimed mined land.

“Texas Teachers Participate in Coal Mining Workshop at the NAC Sabine Mine
June 17 – 22
Hallsville, Texas

Highlights of the workshop included tours of the NAC Sabine Mine, AEP’s Pirkey Power Plant, and reclaimed mined land.

“I truly enjoyed this training. My knowledge base expanded exponentially.”
– M. Walker

“I’m normally not this glowing in my evaluations – but this was a truly phenomenal experience. I appreciate the time and effort of everyone involved to improve my teaching. Not only will this change the way I teach mining, I am now so much more knowledgeable about career options for students with a variety of interests. You guys did a fantastic job! Thank you.”
– C. Pitt

Mesquite ISD Teachers Participate in Industrial Minerals Mining Workshop
June 10 – 15
Round Rock, Texas

Highlights of the workshop included tours of the Acme Brick Company, Texas Quarries, the clay pit at Southern Clay Products, and the Marble Falls Quarry at Capitol Aggregates.

“Most of the activities performed at the TMRA workshop were exciting and very hands-on. My students will have an opportunity to touch, feel, and smell industrial minerals and really understand them. If students can touch something like a rock or marble cake, they can really make a connection with it.”
– Clistie Turnipseed, 5th Grade, Hodges Elementary, Mesquite, Texas

“‘What I’ve most enjoyed about the TMRA Coal Mining Workshop is the hands-on activities. We’ve learned how to do student activities that we’re able to take back to the classroom and immediately implement with students to help them learn about coal production and everything involved: density, aquifers, and reclamation. There’s so much they need to know about to help make science more exciting and to help them pass state tests.”
– Laura Maricle, 5th Grade Science, Bens Branch Elementary, Porter, TX

“‘These industry experts are so phenomenal! Whether it’s being the dragline operator or the reclamation technician, any question you can come up with they were able to answer. And they answer questions not only to your satisfaction but in a way you can understand and take that same question to pose to your kids and give them a valid answer. I just can’t describe how much I’ve learned and how much I’ve done; I’ve enjoyed the experience so much.”
– Vicki Williams, 8-12th Grade Science, Alexander Middle School, Pearland, TX

“It’s most enjoyable about the TMRA Coal Mining Workshop is the hands-on activities. We’ve learned how to do student activities that we’re able to take back to the classroom and immediately implement with students to help them learn about coal production and everything involved: density, aquifers, and reclamation. There’s so much they need to know about to help make science more exciting and to help them pass state tests.”
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– Clistie Turnipseed, 5th Grade, Hodges Elementary, Mesquite, Texas
“What I most enjoyed out of this entire experience was having the opportunity to work with other teachers in similar grades and those experts in the industry that provided us with real-life applications of these minerals. Just meeting new people and having faces to connect with what’s going on in the industry is exciting.”
– Deandre Lester, 5th Grade Science, Hodges Elementary, Mesquite, TX

“I would recommend this workshop hands-down to a colleague. TMRA makes it so enjoyable. You’re constantly learning and getting so much background knowledge. TMRA provides activities to bring back to the classroom. The workshop was 100% hands-on which is how our students want to learn also.”
– Leslie Mathews, 5th Grade, Shands Elementary, Mesquite, TX

Texas Teachers Participate in Coal Mining Workshop at Luminant’s Big Brown Power Plant and Mines

July 8 – 13
Fairfield, Texas

Highlights of the workshop included tours of the Big Brown and Turlington Mines, Big Brown Power Plant, and reclaimed mined lands.

38 South Texas Teachers Learn the Science behind Uranium Industry

July 30 – August 3
Corpus Christi, Texas

Highlights of the workshop included tours of MULLC’s uranium plant in Brooks County, and the South Texas Nuclear Project in Bay City.

“Wow! As an educator I have NEVER been to a conference that catered so much to us. I appreciate how friendly the presenters were. I loved the fact that they taught at our level. Activities can be translated right into the lessons in the classroom!”
– Anonymous participant

“Thank you for a wonderful week! I learned a lot and leave with a deep respect for the industry.”
– L. Guerra

“The workshop helped me to understand the energy process so much more. I feel like I can take the information I have learned back to my kids so they can be better informed.”
– T. Krnavek

“Wow! As an educator I have NEVER been to a conference that catered so much to us. I appreciate how friendly the presenters were. I loved the fact that they taught at our level. Activities can be translated right into the lessons in the classroom!”
– Anonymous participant

“I appreciate the quality and obvious preparation in making this a valuable use of my time.”
– Anonymous participant

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Quiet with anticipation, eighteen teachers exited the charter bus, proudly donning their new “TMRA Teacher” hard hats and hiking boots. They carried backpacks filled with sunscreen, plastic baggies, small shovels, notepads and cameras and were determined to locate “something good.” The teachers assessed the surroundings: miles of conveyor belts carrying gravel in different directions, giant trucks and trains, the loud rhythmic sounds of the machinery. One teacher asked, “May we collect samples here?” The tour leader chuckled and replied, “Sure, but this is just the parking lot.” As the teachers hurried to fill their baggies with gravel, another teacher explained, “But it will be great to use in my science classroom.” This scenario and similar others occurred last June during a unique teacher professional development program which included participation in the TMRA Industrial Minerals Workshop.

Last year, we were awarded the “Earth Science for Elementary Teachers” Teacher Quality grant, which was funded by the Texas Higher Education Coordinating Board for approximately $114,000. This grant was designed with the collaboration of Francye Hutchins, TMRA Education Director, and Mesquite Independent School District to provide a yearlong earth science training opportunity for eighteen grade 5-6 science teachers. The program began last June with a four week summer course, “Geology for Teachers,” and will continue to meet monthly during the academic year. The grant funding provided tuition for participants to receive two graduate-level courses at Texas A&M University-Commerce, iPads with iMovie and additional teaching materials. TMRA graciously provided the hotel accommodations, most meals, charter bus transportation to the field locations, training and manuals, and snacks and drinks for the week-long Industrial Minerals Workshop for the teacher participants and ourselves. Without the TMRA Workshop funding, this part of the course would not have been possible.

The summer course consisted of two weeks of classroom instruction that focused on earth science topics (e.g., geology, plate tectonics, rocks and minerals), science teaching methods and technology applications. The class then attended the one-week TMRA Industrial Minerals Workshop in Round Rock, Texas. During this training, the participants learned additional earth science content (e.g., mining, processing and use of industrial minerals and reclamation) via classroom and field experiences at several TMRA member locations including: Capitol Aggregates and Chemical Lime, Acme Brick, Southern Clay Products, a hot mix and ready mix plant, and Texas Quarries. Participants took many videos and pictures of these locations and collected many pounds of samples to use in their classrooms. After returning home, the participants created instructional presentations incorporating the vast amount of photos and videos they made during the TMRA IM Workshop. The classroom instruction resumed and focused on best ways for the participants to incorporate their new knowledge, collected samples and presentations into their classrooms.

As a part of most grants, assessment is required to indicate the effects of the training on the participants. Preliminary data support that this group of participants have gained impressive amounts of earth science content knowledge, teaching methods and confidence in their science teaching abilities, all which improve classroom learning. However, an important value of the TMRA IM Workshop cannot easily be quantified – the changes in
perspective about the mining and reclamation industry.

Prior to this summer course experience, few of the participants could provide an example of an “industrial mineral” and none could explain how any of the raw materials were mined, processed and used. We observed that the participants carried their new knowledge into after-hours activities. Groups identified rocks, landforms and examples of weathering and erosion while kayaking, hiking and observing the bat colonies in Austin. One participant even questioned if the Outlet Mall was constructed with local materials.

After returning home, participants wrote responses describing what they learned during their stay in Round Rock. Some of these responses included, “I can’t wait to tell my students about all the earth science job opportunities available,” “There are good IM-related careers for people of all education levels,” “I never thought rocks were so important in our everyday lives,” and “Mining really isn’t what the media says.” These changes in personal philosophy are what make this type of field experience essential. In return, these participants will pass along these enlightened views to their students. Additional questions show a desire to learn more: “Where was my school’s brick made?”, “Could my students make cement in paper cups?”, and “Would TMRA have a workshop focused more on reclamation projects?” As one student summarized, “I’ll never look at a road or building the same way.”

Authors Combined Bios: Becky B. Sinclair is an Associate Professor and Gilbert Naizer is a Professor in the Curriculum and Instruction Department at Texas A&M University-Commerce. Both are specialized in science education and have an interest in teacher professional development. Becky B. Sinclair is an education consultant for TMRA and has participated in the Industrial Minerals and Coal Workshops for the past 4 years.

Note: Dr. Sinclair and Naizer wish to thank TMRA for their commitment to teacher education! They hope to receive future grants that include other TMRA Workshop opportunities.

Teachers Learn about the Economic Benefits and Positive Environmental Impact of the Uranium Industry

By Robin Ford, K-12 science specialist for ESC Region 2

The Texas State Aquarium/ESC2 Texas Regional Collaborative for Excellence in Science and Mathematics Teaching selected thirty-eight teachers from across the region to participate in 100 hours of professional development during the 2012-2013 school year. The focus for this year’s cadre of teachers is increasing knowledge in physics. One of the most misunderstood areas in both physics and chemistry is nuclear phenomena (Physics TEKS 8C, 8D; Chemistry TEKS 12A, 12C).

In an effort to increase public awareness of the impact of nuclear physics in our region, we partnered with the Texas Mining and Reclamation Association to deliver training during the required Summer Science Institute. Francye Hutchins, TMRA Education Director, and Dr. Sheryl Roehl, Project Director, Texas State Aquarium/ESC2 TRC Collaborative, coordinated the partnership, which was no small feat considering we were asking TMRA to double the number of participants from previous uranium workshops. Once the logistics were worked out, the workshop was a success.

The impact of the professional development offered by TMRA during the Fourth Annual Uranium Teacher Workshop held July 30 - August 3, 2012, in Corpus Christi and throughout South Texas will be widespread. During the workshops, teachers were able to network with industry representatives and see firsthand the applications of nuclear phenomena in the nuclear fuel cycle.

Many of the teachers commented on their increased level of awareness of the economic, safety and environmental impact of the uranium industry and how the workshop presented the information in an unbiased way. During the session, teachers were asked to research jobs associated with the industry. The information was presented at a job fair and will also be presented in classrooms across the region, hopefully inspiring the next generation of scientists and engineers.
Coal Mines: They Aren’t Just a Big Hole, They Are a Classroom

Nellie Frisbee, Permit Specialist, San Miguel Electric Cooperative, Inc.

If you have never taken a tour of a Texas coal mine, you are missing an incredible learning experience. Coal mines frequently provide tours to a variety of groups with a variety of interests: school children, college students, politicians, landowners, visiting scientists, engineers, business people, bird clubs, geology clubs and, of course, family members to name a few. During a tour, there is almost always the comment: “Wow, I never knew ___. There is so much to learn from coal mining, even the miners are constantly learning and adapting from one area to another. Mother Nature keeps us on our toes.

At the San Miguel Mine, schools and colleges in the surrounding communities often come for tours in the spring. The school children and college students get to see how power is generated, literally, from the ground up. They can follow the coal from the pit to the power plant and see the transmission lines connected to the plant. They get to see geology, agriculture, wildlife, habitat restoration, environmental protection and, everyone’s favorite, the really BIG trucks Image 1. There is usually a discussion of economic impacts to the community, career possibilities, compliance with federal and state regulations and the cost of draglines.

In 2011, it was San Miguel’s privilege to host a tour for the international American Society of Agronomy meetings held in San Antonio. The San Miguel tour focused on the native and postmine soils and vegetation. The tour attendees were from Alaska, Illinois, and Florida; as well as Canada, Hungary, Peru, China, and other countries. On the way from the power plant to the mine gate, the tour bus got behind a herd of cattle being moved from one pasture to another. The tour guests were thrilled to see a Texas cattle drive, complete with cowboys. On the mine tour, the attendees were able to view and sample open pits of native soils Image 2. They also saw mine soils that were constructed by different methods (an example of adapting from one area to another). The postmine soils were at various stages of weathering so the attendees were able to examine and discuss the developing mineral suites. They were able to compare the native brush country vegetation to the diverse postmine native grasses.

If you have never toured a Texas coal mine, just ask. We would love to show you what you have been missing Image 3.
Ah, the sweet smell of spring, when birds are singing, flowers are blooming, and the screeching and grinding of school buses can be heard as Sabine begins to be inundated with groups arriving to tour our mine.

Most excursions are from area schools. The students are excited to be participating in a field trip and are always full of interesting, in-depth inquiries such as, “How do you know where to find the coal?” and “How much longer will the coal last?”

This year, one unique expedition brought Hallsville High School’s FFA Area IV Kick-Off Camp. Sixty-five students were in attendance, including state, area and district officers as well as local FFA students. The students were enthusiastic and fascinated by the mining process, and left the tour with a much better understanding of the facts surrounding the coal mining industry.

And in late summer, we were pleased to have The Honorable Louie Gohmert, U.S. House of Representatives, and his staff on site to see our operation. Our legislators’ understanding of the importance of coal to Texas is vital to the Texas economy, and Sabine tours allow them to obtain firsthand information.

As you can see, our touring individuals and groups are diverse and their reasons for coming varied, but we have found that all have enjoyed their experiences and benefited from them.

We welcome the opportunity to have groups and individuals come to visit and learn more about Sabine and the coal mining industry. Year-to-date, we’ve hosted more than 675 “tourists,” and in the last ten years have had more than 10,000 visitors come to tour the mine!
Four students were awarded the Texas Mining and Reclamation Association-sponsored Special Award at the 24th Annual Coastal Bend Science Fair (CBSF) held in January at the American Bank Center in Corpus Christi, Texas.

The CBSF, sponsored by Texas A&M Corpus Christi and Del Mar College, is a regional science fair for K-12 students from public, private and charter schools advancing from campus and/or district science fairs in the Coastal Bend region. Approximately 650 students from across the region participated in this year’s event.

“We were thrilled to be a CBSF Special Award sponsor,” said Trey Powers, executive director of the Texas Mining and Reclamation Association. “We understand that these students could very well be our leading scientists and engineers of the future.”

TMRA’s Special Award recognized exceptional examples of a basic earth science concept. Criteria used to judge the winning science projects were the students’ creativity, skills, thoroughness, clarity, neatness, integrity, use of the scientific method and results. The ability to present the project professionally, both orally and by display, were determining factors as well.

“I was extremely impressed with the sophistication of all the projects,” said science fair judge Dain McCoig with Uranium Resources, Inc., a member company of the Texas Mining and Reclamation Association.

At CBSF’s Saturday evening awards ceremony, McCoig presented each winner a trophy and a $100 gift certificate to Ward’s Natural Science for their schools to use towards science materials.

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**WINNERS**

**Roman del Gallo**  
Project: Bust That Rust  
1st Grade, Wood River Elementary School

**Nikolai Ortiz**  
Project: The Most Smog in CC  
3rd Grade, Seashore Learning Center

**Yoseph Mamoud**  
Project: Analysis of Aerobic and Anaerobic Bacterial Cultures using a Winogradsky Column  
9th Grade, School of Science and Technology

**Louay Bachnak**  
Project: Can the DNA repair gene nifi be used to detect bacteria in a fresh water pond?  
10th Grade, School of Science and Technology
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Luminant Takes Teachers to Summer School

A $60,000 Contribution Funded Teacher Workshops Designed to Reach Nearly 5,000 Elementary and Secondary Students

Robert Gentry, Luminant Academy

With the goal of connecting the link for educators between natural resources, their role in energy production and the importance of environmental stewardship, Luminant funded two environmentally focused teacher workshops this past June.

In partnership with Stephen F. Austin State University (SFA), Luminant contributed $30,000 to fund the “Energy, Economics and the Environment” summer workshop. The program, which was held June 10-15, provided 13 elementary and secondary teachers with a comprehensive overview of the relationship between the power generation process, including mining, and environmental stewardship.

The company also made a second $30,000 donation to support the University of Texas at Arlington’s “Environmental Education Summer Institute” program, held June 24-29. Through field workshops, classroom seminars and power plant and mine tours, 15 educators gained insight into the energy industry and learned best practices in reclamation to take back to their communities.

“With the potential to reach nearly 5,000 students, opportunities like these help equip teachers with the knowledge, tools and resources they need to effectively communicate energy-related topics to their students,” said Robert Gentry, curriculum manager of Luminant Academy, Luminant’s employee-focused continuing-education center. “We appreciate the opportunity to help teachers gain greater understanding of the link between energy and the environment.”

Participating teachers will receive three hours of graduate credit upon completion. The SFA program began in 2007 and the UTA program in 1995.
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THEY NEED TO BE ACTIVATED.

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