THE LOUISIANA CIVIL ENGINEER

ACADIANA BRANCH • BATON ROUGE BRANCH
NEW ORLEANS BRANCH • SHREVEPORT BRANCH
Journal of The Louisiana Section

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Norma Jean Mattei, PE
Section President 2004-2005

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THE LOUISIANA CIVIL ENGINEER

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The Louisiana Section is located in ASCE Zone II, District 14. Zone II consists of Districts 6, 7, 9, 10 and 14. District 14 consists of the Louisiana, Mississippi, Alabama and Georgia Sections.

ASCE

President's Message

Norma Jean Mattei, PE

It is an honor to assume the office of President of the Section. As your President, I can assure you that the new Section Board of Directors will strive to serve you well. I am excited and confident to be leading our section and its board and committees to carry out its day-to-day business. The new Board follows in the tradition of many previous successful boards.

I wish to thank the past Section and branch officers and committee chairs for their service. It is because of them and their many volunteer hours devoted to the management of Section and branch operations that the Section so vibrant and successful today. These folks have given of themselves to better our profession without any thought of personal gain. I know that during my more than 10-year association with the New Orleans Branch and its Structures Committee and my more recent involvement at the Section level, I *have* benefitted greatly. It is through these associations that I have come to meet and establish long-term relationships with some very fine individuals. I look forward to having these valued friends long after my tenure is over.

Now to the business of the Section... You may be wondering: *Just what is this year's Board going to do?* Let me outline the planned focus for this year's Board for you. The Board has a primary responsibility to the Section's members to act as a liaison between them and the ASCE National. Through this liaison, the Section is your collective voice, and this voice has been pretty loud and clear (effective) concerning the issues of interest in the past. The Section can boast that 2 National ASCE Presidents have come from its ranks - Walter Blessey and, more recently, Tom Jackson.

The Section's voice is transmitted to the national level via its representatives serving on the District 14 Council and the District 14 Director who represents the District and serves on the ASCE National Board. As you may be aware, the ASCE Constitution was amended in the area of governance during the most recent national election. The ASCE will no longer be politically subdivided into districts and the National Board will no longer have district directors. The National Board will be smaller, with representation from new, much larger *regions* that will replace the districts, the institutes, and others. You can check out the make-up of the new board online at www.asce.org. However, many of the details have yet to be solidified, such as

- How will the representatives from the regions be selected for service on the National Board?
- How long will their terms be?
- How will these positions rotate within a region?
- What are the regions?

Let me assure you that the Section plans to have a voice in ironing out these details.

Another ongoing area of interest to the Section is the ASCE's activities toward implementing its Policy Statement 465. This policy states that the ASCE supports the concept of the master's degree or equivalent as a prerequisite for licensure and the practice of civil engineering at a professional level. *Professional level* means practice as a licensed professional engineer. According to the policy, professional engineering licensure requires

- a body of specialized knowledge (BOK) as reflected by a combination of a baccalaureate degree and a master's degree or equivalent
- appropriate experience and
- a commitment to lifelong learning

This policy came into being several years ago when I was serving on the New Orleans Branch Board. I still remember that this policy stirred up heated debate among our membership. But today, I hear very little discussion in regard to the policy. Most people appear to have lost their intense interest when it was discovered that all current licensees will be grandfathered in. Some are just keeping an occasional eye on this issue, because they expect that changes in licensure will take years and perhaps decades to come to fruition. One reason is that state licensing boards will have to buy into the BOK and adopt the changes into theirs laws and rules.

When or if these changes occur, they will surely affect the future of our profession. They will particularly impact the future character of the professional civil engineers who will be charged with serving the public welfare — of course this is important. So the Section Board will serve as your watchdog. If changes are made to the BOK or if substantial inroads made in expediting the policy's implementation ahead of expectations, you will be kept informed through the Section and the branch leadership. Conversely, your opinions expressed on this and other matters will be communicated to the ASCE National leadership through your Section and branch leadership.

On the Section level, the Legislative Committee has been very active. I am pleased that Thomas A. Stephens, PE, has agreed to continue to serve as its Chair through this administrative year. During the last session of the Louisiana Legislature, the Committee, in tandem with its counterparts in the Louisiana Engineering Society and the American Council of Engineering Companies of Louisiana, was key in killing several bills that would have negatively impacted our profession. For instance, House Bill 1342 attempted to remove engineers from the list of professions, whereby engineering services would be awarded by competitive bidding rather than qualification-based selection. Engineering services are in fact professional services. As such, the quality of engineering services based on low price engineer selection would likely be compromised. This is not in the public's best interest because engineering services are intimately connected to public health, safety and welfare. With the Louisiana DOTD experimenting with design-build contracting for several projects, this Committee's work no doubt will remain an important service.

In the next few months, it is planned that the Section's website will be once again up and running. This endeavor has had a series of unanticipated roadblocks that have decidedly stalled efforts to provide current Section news and information via the Internet. However, we are very close once again to providing this service. Soon you will be able to access the Section's website, www.lasce.com, and find current news and information about the Section and branches, along with a listing of future events and several other informative features. Please check this website out once it is operational. Your suggestions for improvements will be appreciated.

This year, I would particularly like to focus on outreach. Each branch has been very active with various outreach efforts. Some of these efforts focus on aiding civil engineering undergraduates, while others attempt to increase the awareness of K-12 students about civil engineering as a career choice. For example, each year the Acadiana Branch purchases and distributes Building Big books to elementary and high schools in the Branch area. The Baton Rouge Branch has often supported the LSU and Southern ASCE Student Chapters and provided funding for a summer program held annually at Southern. For the past five years, the New Orleans Branch has sponsored *Box City* in the children's area at the Jazz and Heritage Festival. The Shreveport Branch has funded scholarships for civil engineering students at Louisiana Tech. I would like to see this work continued and expanded. The Board will continue to help fund these efforts and encourage pursuing new ideas.

My last focus area is public awareness. Civil engineering is typically not a personal service but a public, or business and industry, service. Consequently, I think it is safe to say that individuals seldom if ever directly acquire civil engineering services as the customer. They do not seek civil engineering services every few years like they do a physician's for a check up. They cannot turn the television on and watch a drama series, *New Orleans Engineer,* or a reality show, *Engineer Swap.* You can find plenty of television drama about lawyers, doctors, police, and politicians. These venues give the general public a perspective and a heightened awareness

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Municipal solid waste landfills past, present and future

By Victor R. Donald, PE

Introduction

Each day approximately 10,000 tons of municipal waste are generated and thrown away in Louisiana and must be disposed of safely. The United States Environmental Protection Agency (EPA) and the Louisiana Department of Environmental Quality use the term *municipal solid waste* to refer to this large volume of unwanted waste material that is thrown away.

Today civil engineers are responsible for siting and designing the facilities to dispose of municipal solid waste in a manner that is protective of human health and the environment. Part of this challenge is the complication of dealing effectively with the geology typical of a large portion of the state of Louisiana — high groundwater and soft soils.

There is another complication to the disposal of municipal solid waste that can be far more challenging than dealing with the geology of Louisiana. Nobody in Louisiana wants a municipal solid waste landfill in their community. This public opposition has created an immense difficulty in obtaining the permits required for municipal solid waste landfill sites. Those who are old enough to remember the typical town dump where the waste was disposed of as late as 20 years ago would not want one of these public nuisances in the community today. It is on this basis that a poor public reception can be easily explained. Let us look at why this distant but strong memory persists.

The past

Prior to the 1980s there were very simple, and often neglected, regulations — inadequate by current standards — that specified how sites that were to receive municipal solid waste should have been selected, designed and maintained. The consequences of inadequate regulation compounded by inadequate enforcement becomes obvious. Town dump sites were selected with convenience and least cost as the main considerations with few regulatory constraints. Many may recall an old abandoned gravel pit that was being filled with waste, or the river-side low lands just outside of town. They were simply referred to as *the dump*.

When the river flooded, our river-side lowland dump site would be improved with additional space. The deposited waste was removed because the flood waters would lift it and the current would then convey a large volume of it downstream. Those who can remember, vividly recall the overwhelming stench, the rodents, the foul liquids, and the other undesirable aspects of these dump sites. In more recent memory, there is the knowledge gained from the frequent and often disturbing news reporting contamination of the soil, ground water and surface water resources caused by inappropriately located and/or managed dump sites. All of these awful memories and experiences are the unfortunate consequences of the lack of adequate regulations compounded by inadequate enforcement that led to dump site selections in what often may have been the worst possible locations.

Gravel pits or depressions that result from mining sand and/or gravel, or borrow pits for excavating select soils that are cut to a depth where more permeable soil conditions will not allow deeper excavation are examples of the poor choices for dump site locations. They are sites that are typically abandoned and remain an eyesore resulting in low property values. If they were also conveniently located, they were strong candidates for a waste dump site based on the previous inadequate regulations and the lack of their enforcement. This practice resulted in many dump sites being located within permeable soils all across America. The resulting serious consequence was the conveyance of the contaminants from the dump sites through the permeable soils that led to the contamination of potable ground water — often a source of drinking water. Another example is the location of dump sites in the lowland areas along rivers and streams causing surface water contamination that often rendered scenic rivers as little more than open sewer ditches.

Also once lacking the standards that regulated the type of industrial wastes and the methods by which they could be disposed, many industrial waste dumps in Louisiana were sited and operated in a manner that provided an even greater potential for contamination than the municipal waste dumps. Many of these industrial waste dumps were sited in the same indiscriminate manner as were the municipal waste dumps. These dump sites accommodated the disposal of chemical wastes that eventually reached the surface and/or the ground water resources in the area adjacent to them. The results have been devastating.

In Louisiana alone, millions of dollars have been spent just defining the extent of the contamination around the industrial and municipal waste dump sites and beginning to clean up some of these sites. Unfortunately, due to the difficulties associated with the anticipated cleanup, many of these sites will be difficult to clean up in our lifetime.

The general public has become aware of the problems associated with industrial waste contamination much in the same way it has become aware of municipal waste contamination — through the media coverage of the past practices and their consequences. This awareness is the reason why the mere suggestion of siting a municipal solid waste or chemical waste landfill in a new area brings out intense public apprehension and opposition. It has been said that if you want to replace community apathy with activism, try getting a landfill permitted.

Awareness

In the 1970s there was a gathering awareness in America of the potential for serious environmental degradation as the consequence of poor landfill siting, design and management. The result of this gathering awareness was the initiative for corrective regulations that can be attributed to many different origins. However, the most compelling origin for the corrective regulations can be attributed to the clichéd expression, *Necessity is the mother of invention.*

Louisiana led the way in the development of the regulations that were the precursor of the present-day regulations. Like many of the other heavily industrialized states, Louisiana was among the first states to become aware of the serious negative consequences of indiscriminate waste disposal. As a result, in the 1970s the Environmental Control Commission, a part of the Department of Natural Resources, was created to develop standards for — among other things — solid and hazardous waste disposal. This was a forward-thinking effort on the part of Louisiana's leadership to provide specific regulations that required low permeability soil liners below all areas of solid waste storage and disposal.

Regulatory intervention

By the 1970s, America's post-World War II

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Editor's note: This article is based on the presentation Donald made during the 2004 Louisiana Civil Engineering Conference and Show by the same title.

population had grown tremendously to over 200 million souls. For the cities, this explosive growth in population was further exacerbated by the migration of the population from the rural farming communities to the urban areas. This caused exponential growth concentrated in the urban areas with greater population density. America was a prosperous nation, and as such, its citizens had long become accustomed to the convenience of disposable products, containers, etc. to the extent that we dubbed ourselves *the disposable society.* The result of these trends was a huge increase in — and concentration of — waste that had to be disposed of in the relatively small urban setting.

Also, post-World War II prosperity in America resulted in huge growth in chemical production and petroleum refining capacity. With this increased capacity, industrialized areas were generating record volumes of waste product. The essentially free disposal of industrial waste created no incentive to minimize the waste generated. The public began to appreciate the consequences of unbridled industrial waste generation and disposal and to anticipate exposure to even greater problems in the future. These conditions combined to create obvious and serious health risks and environmental contamination leading to the outcry for more stringent regulations. This was closely followed by new regulations with restrictions to better protect our health and environment — land, air and water.

Federal regulation

The Federal government began to set similar standards with the Resource Conservation and Recovery Act, that was originally established in 1976. This legislation called for a *cradle-to-grave methodology* to control environmental degradation caused by land disposal of wastes. The initial priority of the Resource Conservation and Recovery Agency (RCRA) included industrial and hazardous wastes. In 1980, the RCRA

- established methods to minimize waste
- introduced standards for land disposal and
- reduced the effects of existing environmental impact caused by previous hazardous waste disposal.

In 1991, Subtitle D of the Resource Conservation and Recovery Act regulations addressed municipal solid waste landfills. Although these regulations gave specific authority to the individual states, they set

- minimum criteria for landfill location
- design standards
- management and closure standards, and
- financial assurance.

These regulations required Louisiana to update existing solid waste landfill regulations, and in 1994 the regulations that are now being used in Louisiana were introduced. A significant result of these new regulations is the reduction in the number of landfills and an increase in their size. The town dumps have been replaced by regional landfills.

The Present

The locations of today's municipal waste landfills are the result of careful siting studies and they are carefully engineered with

- excavations
- liners
- leachate collection and treatment systems, and
- interim and final cover systems

that are designed to be consistent with their planned use and management. A concept of composite (clay and synthetic) liners, combined with a leachate collection system designed to prevent the buildup of hydrostatic head on the liner system is an example of the redundant — *belt and suspenders* — system approach to environmental protection. These measures are in combination with an elaborate waste screening and handling program that includes

- the strict restriction of liquid and hazardous wastes
- the placement of daily cover and
- the construction of an impermeable final cap.

Together, they create a system of preventative measures that are consistent with the planned management of the typical waste landfill. These measures essentially eliminate the potential for the contamination of the ground and surface water that was common and that many in the public experienced and remember prior to the 1980s.

Landfill construction

Today's *landfill cell* is a unit of a waste landfill constructed to receive and safely contain and store waste. It is typically about 5 to 10 acres in area and connected to previously constructed cells by carefully connecting each component of the adjacent liners and leachate collection systems. Landfill cells of this size are typically and commonly constructed as needed every 1 to 2 years at landfills that receive waste at a rate of approximately 500 to 1000 tons per day.

Landfill liner

The design requirements for a landfill liner typically includes a recompacted clay liner that is overlain with high density polyethylene (HDPE) geomembrane liner that is placed in *intimate contact* with the clay liner. The clay liners are constructed as shown in Figure 1 with carefully selected clay soils placed and compacted to achieve low permeability conditions. This is accomplished by placing the clay soils in 6" lifts and compacting them under stringent quality control conditions to verify an effective barrier to the movement of liquids is achieved.

The quality control process associated with clay liner construction always includes continuous observation of its construction and extensive laboratory and field testing of its completed sections such as the nuclear density test being performed by an engineering technician as shown in Figure 2 to verify compliance of the clay with the specified density and its related permeability

Figure 1. The clay liner is being compacted for a landfill cell.

Figure 2. Engineering technician performs a nuclear density test on the compacted clay liner as part of the quality control program for its permeability.

Figure 3. High density polyethylene (HDPE) geomembrane liner is immediately placed over the completed clay liner to form the composite liner system.

Figure 4. Once the seams of the adjacent HDPE liners are welded, the quality control test being performed on the welded seam includes the seam successfully sustaining a specified air pressure.

requirements that are specified in the landfill permit.

The completed clay liner is immediately overlain with a carefully placed HDPE liner that is welded to the adjacent liner as shown in Figure 3. Together the clay and the HDPE liners form a *composite liner system*. Each panel of HDPE once carefully placed on the clay liner and welded to the adjacent HDPE liners form an impermeable barrier.

The HDPE geomembrane installation program also includes a stringent quality control program to reasonably assure that the installed membrane materials used meet the minimum specifications that include

- the methods of placing
- welding to form a good bond, and
- the liner condition (undamaged) during and subsequent to installation.

The quality control test for the liner seam weld is shown being performed in Figure 4 where the seam is subjected to pressurized air. The seam is carefully observed to make sure that it sustains the specified air pressure that otherwise would indicate an inferior seam weld.

Leachate collection system

A leachate collection system is installed over the composite liner system to provide a means for the rapid collection and removal of the liquids that may percolate through the waste mass placed on the composite liner and that may contain constituents harmful to the environment. These liquids are referred to as *leachate.* The leachate collection system is usually a combination of a sand layer that is placed on and covers the entire composite liner system that is sloped downward toward a leachate collection trench which contains a perforated, HDPE pipe surrounded by a gravel field. The leachate collection trench itself also slopes downward to a sump where a pump is installed to remove the leachate collected.

A typical leachate collection sump design is shown in the drawing in Figure 5. A completed municipal solid waste landfill cell that is ready to receive waste is shown in Figure 6 with the leachate collection sand placed on the composite liner system that is sloped downward to the leachate collection trench that is also sloped downward to the sump in the background.

The regulations require the leachate drainage and collection system to be designed such that a head of no more than 30 cm of leachate can occur over the composite liner system. This design head is estimated by using the local rainfall records and evaporation information, estimates of the anticipated permeability of the waste material to be deposited and the specific geometric design of the leachate drainage and collection system.

Landfill management and closure

Waste placement is a carefully regulated process. Its placement activities are confined to as small an area as it is possible, and it is required that the waste deposited must be cov-

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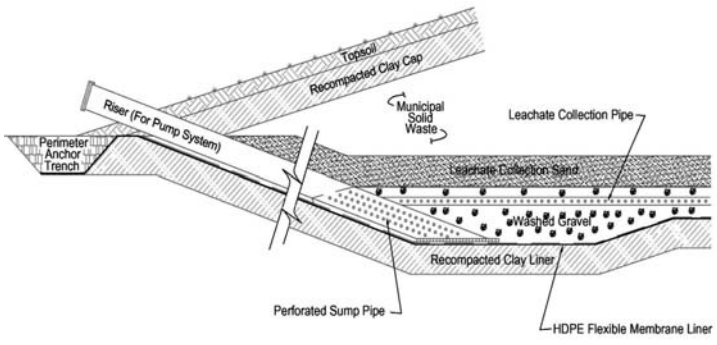

Figure 5. A drawing showing typical leachate collection sump details.

Figure 6. A nearly completed landfill cell with the sand layer placed on top of its composite liner system. The composite liner system drains to the leachate collection trench (left foreground) that in turn drains to the sump located in the background.

News from the Branches

BATON ROUGE

By André M. Rodrigue, PE, President

As we head into the fall months of 2004, the Branch leadership is excited about the upcoming events planned. In October, the Branch will jointly host a membership meeting and luncheon with the Baton Rouge Chapter of the Louisiana Engineering Society. The featured topic for this meeting will be ethics that has always been a hot item of discussion in the past. Moving into November, we will welcome Fred Raiford, East Baton Rouge Parish Public Works Director, as our keynote speaker. His presence is guaranteed to draw a large attendance of members because our local DPW plays such a crucial role not only on our professional lives but also our personal lives. Immediately following this meeting a Geotechnical seminar will be offered worth 1 PDH.

At the end of the calendar year, the Branch will host its annual Christmas Party at the Bocage Racquet Club on the night of December 3. Unlike the monthly luncheons, this function is purely social and festive. It is a time for members to bring their significant others with them to intermingle with fellow members as we celebrate the holidays. The younger members are especially encouraged to attend this event and take advantage of the networking experience with other members.

The expeditious planning of these future events was made possible by the smooth transition from the previous and current Branch Board. I am very grateful for the guidance provided and the efforts made by David Burkholder, our Branch president for the past year. David's term as Branch president was epitomized by the success of the last two Branch membership meetings. One was the Mayoral Candidate Forum held in August — a major effort that involved months of planning and participation with other professional and technical societies. These efforts led by David came to fruition with all the major candidates in the race for East Baton Rouge City-Parish Mayor-President attending the meeting to discuss the issues presented. At our last scheduled luncheon in September, Blaise M. Carriere, PE, Assistant to the Louisiana DOTD Secretary for Policy, discussed new business practices at the DOTD and sparked numerous questions from the large crowd of members who attended.

Beyond the new year the Branch plans to become more involved with the local universities — LSU and Southern. It also plans to continue to offer outstanding speakers and subjects during the membership meeting luncheons and a chance to earn PDHs through technical seminars.

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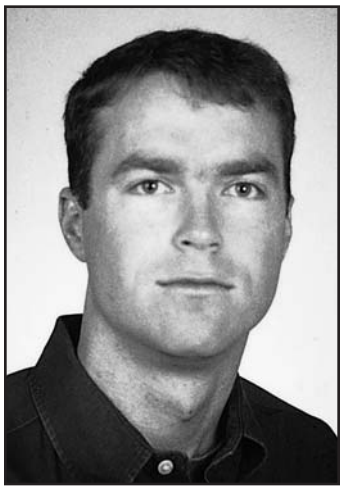
André M. Rodrigue



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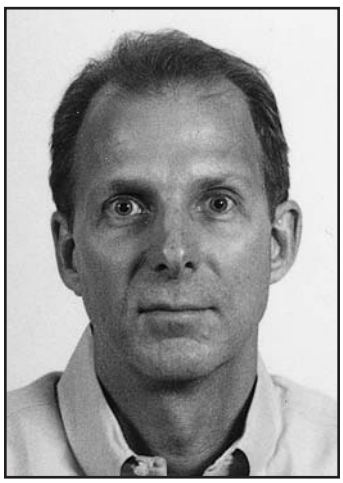

David Burkholder

ACADIANA

By Kimberly Landry, EI, President

The Branch kicked off the 2004-2005 administrative year a little early this year by co-hosting a 4-hour seminar in partnership with Coastal Culvert & Supply, Inc. of Eunice, Louisiana. The seminar, held September 8, 2004 at the Best Western Hotel Acadiana, presented information pertaining to storm drainage products, bridge solutions, and erosion control materials. Both Coastal Culvert & Supply and the Branch were overwhelmed by the fantastic response and would like to jointly thank all those who were in attendance for their participation.

The 2004-2005 Branch Board of Directors was installed during the Branch membership meeting on September 22nd. The officers on the Board of Directors are

- Kimberly D. Landry, EI, President
- Dax Douet, PE, President-Elect
- M. Jamal Khattak, PE, Vice President
- Joseph P. Kolwe, Jr., EI, Secretary
- Clint S. McDowell, PE, Treasurer
- John E. Bosch, Jr., PE, Past President

The new officers welcomed to the Board were Joe Kolwe and Clint McDowell. On behalf of the Board of Directors, I would like to thank Patrick J. Landry, PE, Director at Large, for performing the installation ceremony.

The Branch is looking forward to hosting the 2005 ASCE Louisiana Section Annual Spring Meeting and Conference. Details are still being worked out. Please periodically check out our website www.asceacadiana.net and this maga-

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Kim Landry

Dax Douet

Jamall Khattak

Clint McDowell

SHREVEPORT

By Kurt M. Nixon, PE, President

The September Branch membership meeting marked the beginning of the new term in active service for our branch officers who were installed during the Branch's Annual Spring Golf Tournament held in June. The Branch officers for the 2004-2005 administrative year are

- Kurt M. Nixon, PE, President
- Ashley T. Sears, EI, President-Elect
- Elba U. Hamilton, EI, Treasurer
- Rusty L. Cooper, EI, Secretary and
- C. Eric Hudson, PE, Past President

The Branch's Annual Spring Golf Tournament was a success again this year and it was enjoyed by all who participated. As in past years the Branch was able to raise enough money from the net proceeds to make available two scholarships to Louisiana Tech civil engineering students. These scholarships will be awarded during the Winter Banquet of the Louisiana Tech ASCE Student Chapter.

On behalf of the Branch, I would like to offer a very special thanks to Ben Humphries

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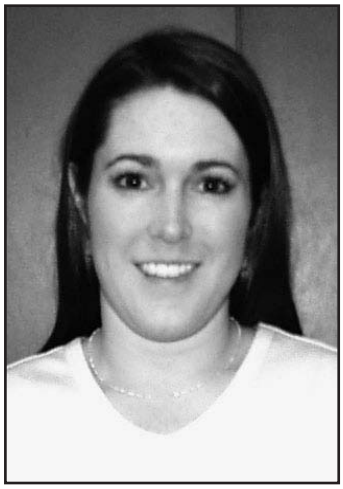
Kurt Nixon



Ashley Sears

Elba Hamilton

Rusty Cooper

NEW ORLEANS

By Deborah Ducote Keller, PE, President

The Branch began its new administrative year this fall with the launch of a promotional video production to be aired in the New Orleans area on WWL television, Channel 15. The commercial will be repeated several times a day over a period of several months. It features local ASCE members demonstrating what civil engineers do.

The elected officers and directors of the Branch were installed during the Section Annual Meeting and Awards Banquet hosted by the Branch. The following are the Branch officers and directors who will serve on the Branch Board of Directors for the 2004-2005 administrative year.

- Deborah Ducote Keller, PE, President
- William H. Sewell, Jr., PE, President-Elect
- Christopher L. Sanchez, EI, Vice President
- Ronald L. Schumann, PE, Treasurer
- Nathan J. Junius, EI, Secretary
- Benjamin M. Cody, EI, Director
- Mohammmad Tavassoli, PE, Director
- Christopher G. Humphreys, PE, Director and Past President

The members of the Branch who volunteer to serve their fellow Branch members as its officers, directors, and committee chairs are truly dedicated to our profession and committed to providing quality volunteer service. Their services actually go well beyond the Branch and the Section membership since they extend to — and are used by — many other civil engineers in our community who attend the Branch-sponsored seminars and conferences. Theirs is no small effort considering the quality technical seminars conducted throughout the year that are organized and presented by the technical committees, the support provided to the University of New Orleans and Tulane University ASCE student chapters, the community outreach efforts that are extended throughout the year, and, in particular, the outstanding Louisiana Civil Engineering Conference and Show that provides a significant continuing education and professional development opportunity for civil engineers at a very affordable price.

The Louisiana Civil Engineering Conference and Show is produced annually as a joint effort by the Branch and the Louisiana Chapter of the American Concrete Institute. The Branch ASCE co-chair for the 2005 Conference is Ronald Schumann. The wide array of excellent technical seminars presented during this 2-day conference allows licensed engineers the opportunity to earn up to 12 professional development units toward the requirement to maintain their Louisiana engineering license. The host committee for the Conference meets monthly for a year to plan and organize this event. The net proceeds from the Conference provide funds to the Branch that support its programs such as the previously discussed television commercial, radio commercials, a children's booth at JazzFest, and participation in New Orleans science fairs and other community outreach projects that promote civil engineering.

The 2004 Conference held September 9th and 10th and housed in the facilities of the Pontchartrain Center in Kenner exceeded our expectations in both attendance and the quality of the technical presentations and vendor

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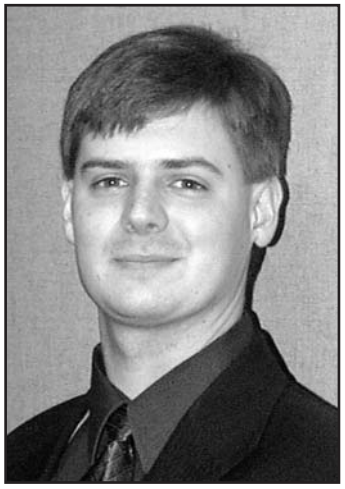
Deborah Keller

William Sewell



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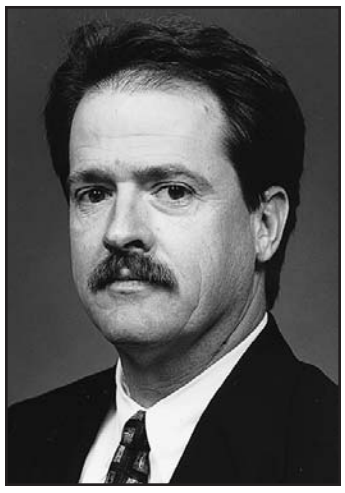
Nathan Junius

Ronald Schumann

Ben Cody



Chris Humphreys

New Orleans Branch Structures Committee 2004 Annual Report

By Mark Gonski, PE

The Structures Committee had another active year, presenting seminars, supporting local engineering fairs and projects, and co-producing a video aired on WWL Channel 15 News. The committee sponsored 6 seminars during the 2003-2004 administrative year. A brief description of these seminars follows:

• *Vortex induced vibrations VIV.* (2003 Offshore Seminar) presented by Dale Ramsey, PE, of New Orleans and Bala Padmanabhan of Houston, Texas on October 9, 2003. The seminar informed participants of a relatively new consideration of a phenomenon that affects floating structures in the Gulf of Mexico and other offshore areas. "VIV" is a significant design load condition caused by loop/eddy currents, that when not addressed during the design phase has forced platform operators to resort to expensive, remedial measures. The presenters discussed design methods and solutions. Tendons on existing tension leg platforms and mooring systems for SPARS where used as examples.

• *Liquid containing concrete structures* presented by David Kittridge, PE, of Maitland, Florida on December 3, 2003. The basis of this seminar was the new ACI publication, *Code Requirements for Environmental Engineering Concrete Structures,* ACI 350-01. The 3 main ingredients for a properly designed concrete tank; material specifications, reinforcing steel design and the details were presented. The difference in criteria between concrete tanks and buildings was stressed. The importance of limiting cracks and the methods to do so were discussed as was the proper detailing.

• *International Building Code (IBC) with applicable foundation amendments,* presented by Subhash Kulkarni, PE of Metairie on January 29, 2004. The City of New Orleans now uses the IBC as the basis for the City Building Code. The City amended the IBC to address regional conditions mostly concerning its unique foundation issues. The presenter — a member of the committee that developed the amendments — concentrated on the foundation aspects of the City Building Code and specifically addressed the variances made in the IBC for it.

• *Legal responsibilities of structural engi*neers (Annual David Hunter Lecture), presented by Thomas L. Jackson, PE, and Richard E. King of New Orleans on March 31, 2004. They addressed the responsibilities of the structural engineer from the perspective of an engineer and a lawyer. Case histories such as the Kansas City Hyatt disaster were used to support their theses. The huge responsibility of structural engineers for property and human life that may be lost in the event of a structural failure was stressed throughout the presentation.

• *Finite element analysis and modeling,* presented by Kenneth Will of Georgia Tech; Atlanta, Georgia on April 29, 2004. A basic understanding of finite element theory was presented followed by a discussion of many of the basic assumptions that are made. Examples of problems that are often encountered during modeling were provided and the interpretation of the results of finite element analysis was discussed. Common modeling errors were discussed as were the future trends in finite element software.

• *What's new in wind loading codes and standards* presented by Marc Levitan of LSU; Baton Rouge on May 20, 2004. His presentation centered on ASCE 7 and major revisions made to it since 1995. He reviewed and attempted to simplify recent changes in wind loading codes and discussed the wind provisions of ASCE 7 and the *International Building Code.* He explained the relationship between code-specified wind speed and the wind speed associated with the Saffir/Simpson Hurricane Scale. He also discussed the future proposed changes in wind loads that are expected in the next few years and how they will impact design codes.

The Structures Committee currently has two seminars scheduled for the 2004-2005 administrative year:

- 2004 Offshore Seminar, November 17, 2004
- Post Tensioned Slabs, December 9, 2004

All seminars sponsored by the Committee are held on the campus of the University of New Orleans. Their dates and other pertinent information including credit card registration can be found on the New Orleans Branch website at www.ascceno.org. To add your name to the Structures Committee mailing list, e-mail Mark Gonski, mark.h.gonski@mvn02.usace.army.mil. The Committee is always interested in proposed new topics and speakers. Please forward any recommendations you may have to Om Dixit, om.dixit@dmjmharris.com.

The Structures Committee joined with the New Orleans Branch to develop a television commercial that is airing on WWL Channel 15 Newswatch in the Greater New Orleans area. The commercial promotes civil engineering and encourages young students to consider civil engineering as a viable career opportunity. WWL produced the video for which Branch members furnished the input. WWL has provided the viewing schedule and it is available by e-mail request to Mark Gonski. The video will eventually be loaded onto the Branch website, asceno.org, next month.

The Branch Structures Committee plans to continue its support of MATHCOUNTS and the regional science fairs to which the committee provides judges, monetary awards and donations to both. Committee member Norma Jean Mattei, PE, organized the annual ASCE involvement at the New Orleans Jazz and Heritage Festival held at the Fairgrounds. The activity attempts to foster an understanding of civil engineering in young students. The Structures Committee is now considering joining the Structural Engineering Institute (SEI) while retaining affiliation with the New Orleans Branch.

The Committee elected its new leadership. The officers for 2004-2005 are:

- Om Dixit, PE, Chairman
- James Danner, PE, Treasurer
- Tom Smith, PE, Vice-Chairman
- Mark Gonski, PE, Editor

The Structures Committee has 14 members and recently added a new member, Mike Choudhry, PE. Mike is an accomplished consultant and very active in the American Concrete Institute.

(Continued from Page 4)

of these professions, albeit often a skewed one.

A few years ago the Acadiana Branch had a 30-second commercial about civil engineering professionally produced and ran it in public service slots on local television. Their objective was to increase public awareness of civil engineering as a great career choice, so it targeted kids. The New Orleans Branch and its Structures Committee together have recently created a commercial targeting adults. Mark Gonski chaired the committee that diligently worked on developing this commercial. It is presently running in the metro New Orleans area on Cox Cable's WWL Channel 15 rebroadcast. Please view it if you get the chance and let me know what you think by email at nmattei@uno.edu.

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The following are the Branch officers and directors who will serve on the Branch Board of Directors for the 2004-2005 administrative year:

- André M. Rodrigue, PE, President
- Thomas T. Roberts, PE, President-Elect
- Brant B. Richard, PE, Vice President
- Robert W. Jacobsen, PE, Secretary-Treasurer
- Gregory P. Sepeda, PE, Director
- Adam M. Smith, EI, Director
- Stephen M. Meunier, PE, Director
- David M. Burkholder, PE, Past President

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zine in the upcoming months for more information as the plans are developed.

The Branch is pleased to note that the University of Louisiana at Lafayette ASCE Student Chapter plans to host the 2005 Deep South Conference April 7-9, 2005. The Deep South Conference — a regional organization of student chapters — has expanded over the years to include 13 student chapters representing all of the universities in Louisiana with student chapters and some of the universities with student chapters from 3 adjacent states. Activities planned for the Conference include concrete canoe, steel bridge, environmental engineering, asphalt pigeon and land surveying competitions.

We would like to encourage all Section members to consider lending a helping hand to this enthusiastic group of students by volunteering as an event judge or by becoming a Conference sponsor. Please contact Paul A. Richards, PE, at par6763@louisiana.edu and see the Chapter's news entry in this issue for more information.

Have a happy Thanksgiving!

Highlights of the Section Annual Meeting and the Louisiana Civil Engineering Conference and Show

The 2004 Louisiana Civil Engineering Conference and Show was held September 9th and 10th in the facilities of the Pontchartrain Center in Kenner. This annual event is sponsored jointly by the New Orleans Branch and the Louisiana Chapter of the American Concrete Institute.

The 2004 Conference surpassed all previous conferences with an attendance exceeding 600 registered participants. It was deemed a huge success that is attributed to the interest demonstrated by the engineering community and the Conference sponsors in response to the opportunities provided by the large variety of exhibitors and the quality technical sessions. There were approximately 35 exhibitors and 25 local engineering firms that sponsored the Conference.

Though a Branch-sponsored event, the Conference has become a Section-wide event with registrants from New Orleans, Baton Rouge, Lafayette, Lake Charles and Shreveport. The technical sessions presented during the Conference that are attended by licensed engineers in Louisiana qualify for professional development units required by the Louisiana Professional Engineering and Land Surveying Board for them to earn to maintain their licensure in Louisiana. The 2-day Conference provided the opportunity for them to earn up to 12 professional development hours at a very reasonable cost. The technical session topics covered a broad spectrum of technical and professional interests including civil, structural, environmental and geotechnical engineering, design codes, surveying, and ethics.

The Conference continues to be a success because of the efforts of a dedicated committee that was chaired this year by William H. Sewell, Jr., PE. This committee meets regularly for 11 months and collectively contributes hundreds of hours of work to produce the high quality conference that we have come to expect over the past 14 years. Members of the 2004 Conference committee included

- Gustave S. Cantrell, PE
  Exhibitors/Accounting
- Stephen C. Bourg, PE
  Registration
- Norman Jean Mattei, PE
  Exhibitors and Door Prizes
- Frank C. McCaskell, PE
  Website and Publicity
- Christopher L. Sanchez, EI
  Treasurer
- Harry Stinchcomb, Jr.
  Catering and Banquet
- William W. Gwyn, PE
  Sponsors
- Thomas M. Smith, PE
  ACI Co-Chair
- Ryan C. Koenig
  Technical Program and Speakers

District 14 Director Dennis Truax installs Section and New Orleans Branch officers during the Section Annual Meeting in New Orleans. From the left the New Orleans Branch officers are Mohammad Tavassoli, Nathan Junius, Ronald Schumann, Chris Sanchez, Bill Sewell and Deborah Keller; and the Section officers are Norma Jean Mattei, Kim Martindale, Tim Ruppert, Ray DesOrmeaux, Chris Humphreys and Daniel Bolinger.

Planning for the 2005 Louisiana Civil Engineering Conference and Show will begin soon. The Conference committee that has done such a great job over the past several years will largely remain intact under the leadership of the 2005 Chairman, Christopher L. Sanchez, EI.

The evening of September 10, 2004 following the Conference, the New Orleans Branch hosted the Section Annual Meeting and Awards Banquet that features the installation of Section and New Orleans Branch officers. The event was held in the facilities of the New Orleans Country Club and it was attended by approxi-

President Barbara Featherston presents a commemorative plaque to Chris Sanchez for the Section Outstanding Young Civil Engineer award.

President Featherston receives a plaque commemorating her service as Section President from incoming Section President Norma Jean Mattei.

President Featherston receives a past president's pin from incoming president Norma Jean Mattei.

mately 75 members and their guests. The officers and directors of the New Orleans Branch who were previously elected were installed with the Section's officers and directors by District 14 Director, Dennis D. Truax, PE. The installation ceremonies are a required part of the agenda of the Section Annual Meeting.

Several members of the New Orleans Branch received Section awards during the Annual Meeting. They include **Ralph W. Junius, Jr.,** PE, who received the Section award for Outstanding Civil Engineer, **Herbert J. Roussel, Jr.,** PE, who received the Section award for Lifetime Achievement, **Christopher L. Sanchez,** EI, who received the Section award for Outstanding Young Civil Engineer and **David A. Wagner,** PE, who received the Section award for Outstanding Government Civil Engineer.

Ralph Junius accepts the Section Outstanding Civil Engineer award.

- Oberservation -

Lifeline Engineering:

Thomas Sowell in his op-ed column appearing in the Baton Rouge *The Advocate* (12/31/03) observes that

"Within a week of each other... an earthquake measuring 6.5 on the Richter scale in California and a 6.6 earthquake in Iran... the human costs were enormously different....

"The deaths in Iran have been counted in the tens of thousands. In California, the deaths did not reach double digits...."

Based on this observation, he cobbles a strong thesis that

"Wealth enables homes, buildings and other structures to be built to withstand greater stress. Wealth permits the creation of modern transportation that can quickly carry people to medical facilities. It enables those facilities to be equipped with more advanced medical apparatus and supplies...

"...Hurricane Andrew in 1998... took fewer that 50 lives. Yet another hurricane, back in 1900, took at least 6,000 lives in Galveston, Texas.

"The difference was that the United States was a much richer country in 1998. It had earlier warning from more advanced weather-tracking equipment... better roads... more cars... more and better (rescue) equipment... better medical treatment...."

As an engineer who has been fed and believes the party line from the ASCE to the National Society of Professional Engineers about the almost singular importance of engineering in the advancement of public health and safety, I suppose I should be offended by Sowell's thesis replacing the presumed preeminent role of engineering with wealth.

His thesis should legitimately raise questions by which to seek balance. Does technology through engineering create wealth? Does wealth create technology? It seems to raise the age-old question about which came first, the chicken or the egg? Or does it really matter? I believe that a review of history will reveal that a synergistic relationship exists between the creation of wealth and the advancement of technology and that it has existed throughout history.

- Editor

(Continued from Page 9)

with Delta Process Equipment who was the featured speaker for the September membership meeting. Ben came over from Ruston on a very short notice to substitute for the original featured speaker who was unable to attend as a result of Hurricane Ivan. Ben presented an excellent technical session for those of us in attendance. It was titled *Sewer Pump Station Design & Application*.

The October Branch membership meeting is scheduled to be held in the facilities of the Petroleum Club and it will be a joint meeting with Shreveport Chapter of the Louisiana Engineering Society. The featured speaker will be State Representative Mike Powell, who serves on the House Transportation, Highways and Public Works Committee. He will present an update on state transportation projects.

In conclusion and on behalf of the Branch, I would like to thank C. Eric Hudson, PE, for his efforts during the last administrative year in service as the President of the Branch. Eric did a great job in coordinating the Section Annual Spring Conference hosted by the Branch. He also planned some of the informative technical presentations for the Branch membership meetings and recruited a couple of dedicated new Branch officers.

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exhibits. The evening following the conclusion of the Conference, the Branch hosted the Section's Annual Meeting and Awards Banquet in the facilities of the New Orleans Country Club. It was well attended by Branch members and Section members visiting from other branches and their guests. The Section and Branch officers and directors who will serve on their respective boards during the administrative year that began at the conclusion of the Annual Meeting were installed as part of the business of the Annual Meeting.

As part of the service to its members, the Branch will continue to host membership meeting luncheons with featured speakers and programs throughout the year to provide an opportunity for its members to network and, most importantly, to get updated with timely professional, technical and community issues that can be presented within the time constraints of the luncheon meeting format. In addition, the Branch Structures Committee that has been historically composed of a very active group of members who are keenly interested in structural engineering will continue to share their enthusiasm with other structural engineers in the community by organizing and hosting in-depth technical seminars held in the evenings during the year. (The Committee's 2004 annual report is in this issue.) Om Dixit will be leading this effort.

The Branch Younger Members Committee, chaired this year by Jonathan E. Hobbs, EI, plans several events geared toward its constituents, the members under 35 years old. The Committee's planned events include socials, community outreach activities and mentoring programs with the participation of the Branch's *more experienced* members.

Information about — and registration for — the many Branch activities planned this year will be posted on the Branch website — www.asceno.org — as they are scheduled. The Website Chair is Frank C. McCaskell, PE. Links for the Branch officers, directors, and committee chairs are provided on the website for easy contact.

I am looking forward to another great year working with the officers, directors, committee chairs and the membership of the Branch. As we share and continue to build a common vision of the potential of the civil engineering profession through our ASCE membership and active participation, my goal this year is to solidify this vision in part. I hope to encouraging our members to focus on developing their leadership skills so that our role as civil engineers in the community is transformed. How? We would seek to become proactive community leaders who can, and do, effectively contribute to improving the quality of life in our communities through effective participation and sound engineering practice. I believe that only when we as civil engineers become effective participants in our communities will we be truly appreciated for the problem-solving talents we possess and apply to better our communities.

Student Chapter News

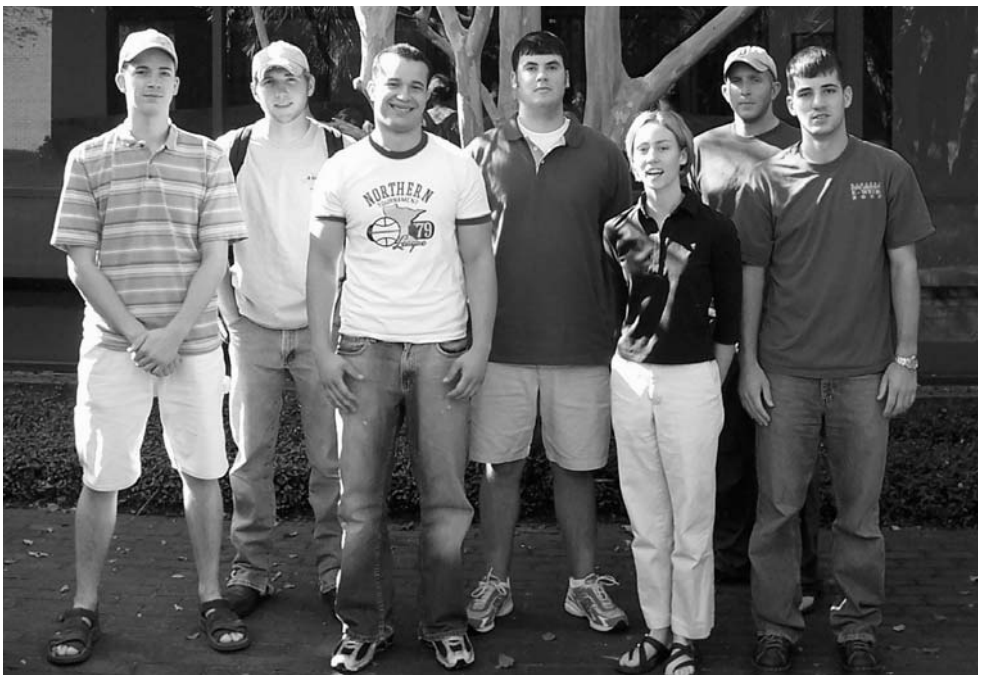
McNEESE STATE UNIVERSITY
By Clayton Cormier

The Chapter held its first membership meeting of the academic school year September 15, 2004. The topic of this meeting was "Opportunities in Civil Engineering." In preparation for the meeting, chapter members paraded around the campus and posted flyers encouraging and inviting freshmen students and others who may be interested in considering or learning about a career in civil engineering to attend. The effort led to 23 students in attendance for this membership meeting which is quite impressive considering that on average there were fewer than 10 students attending the membership meetings held the previous year.

The Chapter's plans for the coming year were discussed. One is to participate in the Deep South Conference of ASCE student chapters to defend the Chapter's regional concrete canoe competition championship and its first place finish in the surveying competition earned during the previous Conference. Another is a field trip to the U.S. Army Corps of Engineers Waterways Experiment Station in Vicksburg, Mississippi. We Chapter members are enthusiastic about all of our upcoming planned events that we believe will allow us to expand our knowledge of engineering beyond the classroom, and we have otherwise dedicated ourselves to a successful year.

Engineering faculty member Bruce Savage, PE, a professor in water resources, was our guest speaker during the membership meeting. He made a presentation that acquainted the students in attendance with what the civil engineering profession has to offer its practitioners. His presentation was also beneficial to the senior civil engineering students because it exposed many of them to the diverse opportunities in the civil engineering profession of which some were not entirely aware.

The Chapter suffered a very disappointing experience last year following the concrete canoe competition win. On the return trip from Oxford, Mississippi the competition canoe developed cracks that could not be repaired if the Chapter were to have entered it in the national competition. There are plans to make improvements on last year's design in an attempt to avoid this handling problem.



Pictured are the McNeese State University ASCE Student Chapter leaders for 2004-05. They are, from the left, Luke Lanier, Secretary; Tyson Thevis, Senator; Justin Durosseau, Public Relations; Steven Hollier, Public Relations; Leigh Rush, Vice President; Mike Hollier, Treasurer; Clayton Cormier, President. Not pictured are Chris Cabaniss, Senator; and Jay Uppot, PE, Faculty Advisor.

TULANE UNIVERSITY

The Chapter is planning to participate in numerous community service activities this year including our first planned Habitat for Humanity work scheduled for October 30th. Several parties are being planned for this year including the Halloween party on October 29th. The Chapter is planning to reinstitute its mentoring program to help the underclassmen become a little more familiar with the Civil Engineering Department and the curriculum.

The Chapter has formed intramural teams to compete in the university-wide sports competition. Currently the Chapter is fielding teams under the name *Strike Force* in the co-ed intramural sports programs for volleyball and indoor soccer.

The next Chapter general membership meeting was scheduled to be held on October 19th at 5:30 pm. The Deep South Conference for student chapters in our region is scheduled to be held in Lafayette in the Spring. This will be the focus of several of the Chapter's committee chairs starting in late November.

The current Chapter officers are:

- Joe Simpson, President
- Steve Shira, Vice President
- Kristin Moan, Internal Secretary
- Jenna Addis, External Secretary
- Rachel Hoffman, Treasurer
- Bart Grasso, Canoe Chair
- Ben D'Arensbourg, Bridge Chair
- Joel Dixon, Senior Representative
- Evan Yost, Junior Representative
- Michael Johnson, Sophomore Representative
- Reilly Thompson, ESC Representative

UNIVERSITY OF LOUISIANA AT LAFAYETTE
By Justin Peltier

The Chapter is the host chapter for the 2004-2005 ASCE Deep South Conference. The Conference is a regional conference of member ASCE student chapters that includes all of the ASCE student chapters in Louisiana and some from the adjacent states. The dates and place for the Conference that is in the early planning stages have been scheduled for April 7-9, 2005 and it will be staged in Lafayette.

The Chapter is planning to host several chapter competitions during the Conference including

- concrete canoe
- steel bridge
- surveying
- environmental/geotechnical and
- asphalt pigeon.

The concrete canoe and steel bridge competitions are official regional competitions where the winning teams are eligible to advance to a national competition.

LSU

By Jason Duhon

The Chapter is already off to a great start for the 2004-2005 academic year. It started things off with a kickoff meeting in September, with the membership competing in a marshmallow tower building competition. After hosting speakers from ExxonMobil and Applied Research Associates for LSU Career Day, the next planned Chapter meetings are scheduled for October 13th and then every other Wednesday for the remainder of the semester.

The chapter officers for the 2004-2005 academic year include

- Jason Duhon, Vice President and acting President
- Liz Holloway, Secretary
- Misty Daigle, Treasurer
- Garrret Sutley, Fundraising Chair
- Anna Wheeler, Community Service Coordinator
- Eric Colwart, Meeting Coordinator
- Duy Nguyen, Concrete Canoe Chair
- Dennis Hymel, Steel Bridge Co-Chair
- Samantha Stroder, Steel Bridge Co-Chair, and
- Todd Hymel, Intramural Sports Coordinator.

These officers along with the roughly 70 other chapter members are working hard to actively represent LSU and the Louisiana ASCE community on the local and national levels.

The Chapter is currently developing plans throughout the year to interact with the community through community service projects and to introduce engineering students to job opportunities. Anyone interested in becoming more involved in the Chapter's activities by making a presentation during a membership meeting or helping sponsor an event is encouraged to contact us at lsuasce@hotmail.com. Please look for future news and announcements for Chapter events in this newsletter or feel free to contact us for more information.

Employment opportunity:

Lafayette-based engineering firm is seeking a project manager who is a Louisiana registered professional engineer. The duties and responsibilities include client, schedule and resource management. Applicant must have experience in at least one or more of the following: road design, drainage design, and land development with construction experience as a plus. Qualified applicants should send résumé to C. H. Fenstermaker and Associates, Attn: Engineering Division, Post Office Box 52106, Lafayette, LA 70505.

Save for college with a 529 Plan

By Thomas R. Thurmond

It has never been more important for the children in your life to receive a college education. Studies show that over a lifetime, the earning gap between a person with a high school education and one who has a college degree may exceed $1 million.[1]

According to The College Board — a not-for-profit educational association — for 2003-2004, average costs for one year at a state university totaled $4,656 (+14.1%) and $27,410 (+6.0%) for a private university.[2] Should you also be thinking about graduate or professional school, the costs will really skyrocket.

A 529 Plan can help

Although funding a child's way through college will never be easy, some help is available through 529 College Savings Plans (also called qualified tuition programs). These plans were created under section 529 of the Internal Revenue Code to help U.S. citizens and permanent residents meet higher education expenses and offer considerable financial benefits, such as:

- *Tax advantages.* Your plan can grow federal income tax deferred. Withdrawals are also free of federal income taxes and in some cases state income taxes[3] when used for qualified educational expenses. If withdrawals are used for non-qualified purposes, it may be subject to taxes and a 10% federal penalty.
- *Gift and estate tax benefits.* Your plan allows you certain gift tax exclusions and offers special estate planning advantages, without triggering federal gift taxes.
- *Flexibility.* You can use your plan's funds at any accredited institution of higher education in the U.S.
- *Additional contributors.* Parents are not the only ones who can contribute to a 529 plan. Grandparents, other relatives and even friends can make contributions.
- *Investment choices.* You can choose from a variety of investment strategies best suited to your individual circumstances and risk tolerance. You will also benefit from the professional investment management skills of major mutual fund companies.

Types of plans

Prior to 1996, prepaid tuition plans allowed you to purchase tomorrow's in-state college education at today's prices. This was an attractive advantage, since you were assured that your bill was prepaid, but this type of plan required that your child attend a school in your state.

Under a 529 Savings Plan, you may create an account in your name and choose a beneficiary — your child, a grandchild, the child of a friend or even yourself. Your regular contributions to the plan can grow tax-deferred until withdrawn and, if spent on qualified higher education expenses, will be tax-free when withdrawn.[4] In most cases, this can result in considerable savings. Best of all, the money can be spent at *any* eligible college or other postsecondary educational institution in the country.

Nearly 529 Reasons to Save

But the reasons to consider section 529 Plans do not stop there. They also feature high contribution limits, often in excess of $200,000 per beneficiary — which can be used by another member of your family in case the original beneficiary does not attend college. Check the program guidelines for eligible family members.

To Learn More

Although Section 529 Plans make saving for college considerably easier, they may not be for everyone. If your child is very young and you are comfortable making your own investment decisions, you might prefer to invest these funds yourself. But whatever route you take, be sure to begin early. To learn more about how you can better invest for your child's education, please contact the author.

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[1] Source: 2002 Trends in College Pricing 2000, The College Board.

[2] Figures shown include tuition, fees, room, board, books, supplies, transportation and other expenses for residential students.

[3] Some states provide state income tax advantages such as tax-free withdrawals and deductions for contributions to residents or other taxpayers who enroll in a 529 plan sponsored by that state. State tax advantages are generally not available to state residents who enroll in another state's 529 plan.

[4] Under current federal tax law the tax-free nature of Section 529 Plans will be automatically repealed at the end of 2010. Thereafter, unless Congress renews or extends the law, earnings withdrawn from a 529 plan will be taxable income of the beneficiary if used for qualified higher education purposes and taxable income of the contributor if used for non-qualified.

Thomas R. Thurmond, Senior Vice President, Financial Advisor with Morgan Stanley in New Orleans, Louisiana. He may be contacted by e-mail at thomas.thurmond@morganstanley.com or by telephone at (504)587-9669 or (800)659-0009. *This article does not constitute tax or legal advice. Consult your tax or legal advisers before making any tax- or law-related investment decisions. Any particular investment should be analyzed based on the terms and risks as they may relate to your circumstances and objectives. Information and data in this article were obtained from sources considered reliable and published for general information purposes. Their accuracy or completeness is not guaranteed and the giving of the same is not to be deemed a solicitation on the part of Morgan Stanley with respect to purchase or sale of securities or commodities.*

Highlights of the August Board of Directors meeting

In recent times, the accounting practices and processes of the Section have been dependent on specialized software to facilitate entering financial data and generate financial reports. Because not everyone who will serve on the Board as its Secretary-Treasurer will have individually purchased the necessary software, nor should they have to, the Board decided to purchase a laptop computer with the licensed software installed. The laptop computer with this installed software will then be passed from one Secretary-Treasurer to the next in the succession. This is expected to substantially ease the burden experienced in the past by the Board members in making the transition in this office with the change in Section administration.

President Featherston encouraged the Board to anticipate and plan to be proactive in identifying and solving the problems that would lead to the effective implementation of the new national governance rules that were adopted by the ASCE membership via the recent election. Her concern was based on recent articles written by national ASCE figures that expressed a concern that would lead one to speculate that a large amount of political capital was expended in the effort and the controversy that led to the adoption of these rules. She suggested that now, since the majority of the ASCE members voting (approximately 6 percent of the total) have spoken, it is appropriate for the Section to move forward on this matter insofar as it is appropriate in the relationship that exists between it and the national organization. The Board formed the skeleton of an ad hoc committee to pursue this matter.

The status of the nominations received from the branches for the Section awards was discussed. Other issues in the awards process were also discussed including the biographies of the recipients gathered by Younger Member Committee members in the nominating branches and the documentation of the ceremony during the Section Annual meeting. The Special Activities and Awards Committee was appointed in anticipation that it will deliberate and recommend candidates for the Section's awards and that its report will be submitted individually to the Section Board Members for their approval well enough in advance of the Section Annual Meeting when it is planned that the award recipients will be recognized.

The planned reimplementation the Section's now dormant website that had been discussed in detail during a previous Board meeting was revisited. Part of the previously discussed reimplementation of the website included the display of the business card listings and advertisements in *The Louisiana Civil Engineer*, the Section journal. This display would include a click-on feature to provide links to the advertisers that have websites. It was anticipated that the advertising rates for the journal would be raised $10 to $20 a year to cover the cost of the website.

Further discussion revealed that the revenues from the current listings and advertisements in the Section journal nominally cover the current cost of its publication. The current advertising rates are essentially the same as they were 12 years ago when the Section began publishing the journal. The reason there has been no need to raise the advertising rates were a combination of

- the number of advertisements have nominally increased over the years
- the printing/publishing costs have been carefully monitored and the competitive printing/publishing market in the Baton Rouge area has been exploited and
- most importantly, the current printer/publisher has routinely implemented new technologies and processes that have kept the printing/publishing costs of the journal relatively flat over the last 3 years.

The roster of the Section and branch officers and committees that is distributed to the Board with contact information for its operations has been historically maintained as a Word document by the Section President. It is being redeveloped as an Excel document where it is anticipated that it will solve the problems with updating the

(Continued on Page 18)

— net surfing—

ASCE national organization:
http://www.asce.org

Note: Most ASCE-related pages can also be addressed through links at this website. All section and branch officers are listed at:
http://www.asce.org/gsd/localofficers

ASCE Acadiana Branch:
http://www.asceacadiana.net

ASCE Baton Rouge Branch:
http://branches.asce.org/batonrouge/index.htm

ASCE New Orleans Branch:
http://www.asceno.org

Louisiana Tech ASCE Student Chapter:
http://www.latech.edu/tech/orgs/asce/

UNO ASCE Student Chapter:
http://www.uno/~engr/asce/asce.html

ULL ASCE Student Chapter:
http://www.engr.usl.edu/cive

Tulane ASCE Student Chapter:
http://www.tulane.edu/~asce

LSU ASCE Student Chapter:
http://www.ce.lsu.edu/~asce

ASCE Louisiana Section:
http://www.lasce.com

Louisiana Engineering Society:
http://www.les-state.org

Louisiana Professional Engineering and Land Surveying Board:
http://www.lapels.com

- Career Benchmarks -

Section members **Kenneth Boagni, III,** PE, **Brent J. Duet,** PE, **Betty S. Ellzey,** PE, **Kristen C. Cancienne,** PE, **Ricardo C. De Abreu,** PE, **Mohammad J. Khattak,** PE, **LeAnn E. Lucas**, PE, **James R. Martin, Jr.,** PE, **Ryan G. Nesbit,** PE, **Kurt M. Nixon,** PE, **Johann L. Palacios,** PE, and **William R. Rossignol, II,** PE, recently earned their civil and/or environmental engineering license in Louisiana. If you are in contact with any of them, please offer them your congratulations on their accomplishment.

Louisiana residents **Boby W. Aboesono,** PE, **Mark A. Arceneaux, II,** PE, **Andre C. Barrios,** PE, **Mark D. Bucci,** PE, **Timothy G. Burdette,** PE, **Krishna S. Chandra,** PE, **Russell Joseph Coco, Jr.,** PE, **Dane S. Coke,** PE, **Steve E. Conravey,** PE, **Jeremy W. DeVille,** PE, **Jennifer F. Duhe,** PE, **Benjamin A. Fernandez,** PE, **Thomas J. Foshee, III,** PE, **Ben P. Fritsche,** PE, **James A. Geihsler,** PE, **Colby J. Guidry,** PE, **Daniel R. Haggerty, Jr.,** PE, **James J. Hance,** PE, **Anna S. Hanks,** PE, **Stephen P. Heraty,** PE, **Joseph B. Johnson,** PE, **Misty D. Lopez,** PE, **Robert L. Lott, Jr.,** PE, **Jeffrey J. Loup,** PE, **Janet L. Manuel,** PE, **Odigwe M. Mokogwu,** PE, **Sinyale W. Morrison,** PE, **Matthew K. Newchurch,** PE, **Joseph C. Picou,** PE, **Chad M. Rachel,** PE, **Daniel R. Roth,** PE, **Kenneth R. Solis,** PE, **Joshua P. Stutes,** PE, **Khalid T. A. Talaat,** PE, **Kristi L. Trail,** PE, and **Nong Yuan,** PE recently earned their civil and/or environmental engineering license in Louisiana and are not members of the ASCE. A copy of this issue of the journal is sent to them as an informal introduction to the Section. If they wish to join and/or find out more about the ASCE, they are hereby encouraged to visit the ASCE national website, http://www.asce.org. If you are in contact with any of these engineers, please consider formally introducing them to the Section by inviting them to attend a branch meeting as your guest.

Editor's note: As a matter of interest, there are two other disciplines that are now licensed by the Louisiana Professional Engineering and Land Surveying Board and that may be considered closely related to civil engineering as is the environmental engineering discipline. They are the architectural and structural engineering disciplines. As of August 2004, there were 1 and 54 licensees registered with the Board in these two engineering disciplines respectively.

Board of Directors Installed

According to the Constitution and Bylaws of the Section, the Board of Directors was elected during the Annual Spring Meeting and Conference in Shreveport. It was installed during the Annual Meeting hosted by the New Orleans Branch September 10, 2004. The members of the Board of Directors are

Officers:

- Norma Jean Mattei, PE, President
- Kim E. Martindale, PE, President-Elect
- Timothy M. Ruppert, PE, Vice President
- E. R. DesOrmeaux, PE, Secretary-Treasurer
- Barbara E. Featherston, PE, Past President

Directors-at-Large:

- J. Keith Shackelford, PE
- Ali M. Mustafa, PE
- Patrick J. Landry, PE
- Christopher G. Humphreys, PE

Assigned Branch Directors:

- Daniel L. Bolinger, PE
- Thomas A. Stephens, PE

(Continued on Page 18)

Norma Jean Mattei

Kim E. Martindale

Tim Ruppert

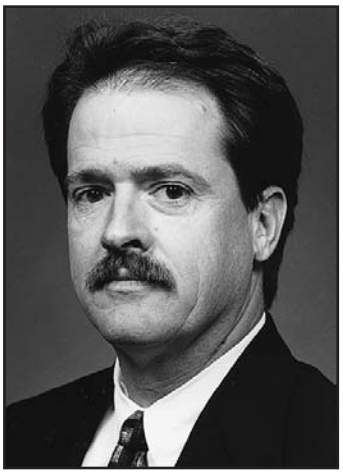
Ray DesOrmeaux

Barbara Featherston

Keith Shackelford

Ali Mustafa

Pat Landry



Chris Humphreys

Daniel Bolinger

Tom Stephens

ASCE reorganization

The October 2004 meeting of the District 14 Council offered much discussion and some insight into the restructuring of the ASCE governance that is beginning in earnest now that the enabling constitutional revisions were adopted by the ASCE membership in the most recent national election. The national ASCE Board of Direction is beginning the process of implementation by developing revised bylaws, new rules and a transition plan.

E. Walter LeFevre, PE, Chair of the ASCE Governing Documents Committee, attended the District 14 Council meeting and provided its members an overview of the planned changes thus far. Part of the current plan that immediately affects the Louisiana Section is that District 14 and District 10 (the Florida Section) will be merged into the new entity - Region 5. The Board of Direction will vote to adopt the new regional boundaries during its October 2004 meeting. The new Region 5 will contain 5 sections

- the Louisiana Section
- the Mississippi Section
- the Alabama Section
- the Georgia Section and
- the Florida Section.

There will be no changes to the political boundaries or functions of any of the sections. Though it is entirely up to the District 14 Council whether to continue in service and for how long, the governing body of Region 5 will become its sections' official governing body and District 14 and District 10 and their directors will cease to exist in this capacity by late 2006. At this time all of the District Councils and the District Directors that represent them and all of the Zones and the Vice Presidents that represent them also will cease to exist in the governance structure.

Under the new governance structure, Region 5 will be represented by one Director on the Board of Direction. There will be a minimum of 5 Governors — conveniently one governor per section — who will staff the many national committees and they will be the more direct liaison between membership and the national organization.

It is up to the individual Regions to create their own governing bodies and processes to appoint and/or elect their representatives. A Region 5 Implementation Task Force to work out the details will be forming in the near future. Each Section will be asked to provide representatives to the Task Force.

Did You Know . . .

...that engineers in construction are using digital cameras to maintain records, improve communication, and resolve legal issues? Digital cameras recommended for this purpose cost about $500 with at least 3 megapixel resolution. Some use 5 megapixel digital cameras priced at $1,000. A digital camera can be part of system software designed to monitor the progress of a project. In one instance digital pictures are merged with project management software to send weekly e-mails. Potential digital camera users should be aware of the resolution (megapixels), boot-up time, wide angle capabilities, and interval between shots desired. *Engineering News Record* 12/29/03

...that the only operational maglev train in the world began passenger service 2/4/04 in Shanghai to Pudong International Airport on a 30 km track. Wheels and rails are replaced by magnets that suspend the train 10 millimeters above a flat track as it travels at a top speed of 430 km/h sustained for 30 seconds during the trip as the train moves smoothly, with little noise or jolting. A magnetic field of traveling waves on the track propels the train along controlling the speed by the intensity and frequency of the driving current. This $1.2 billion venture had a planned extension, the Beijing-Shanghai line, but it was scrapped by China's State Council as the result of recent changes in its top leadership. - IEEE Spectrum on line 3/04

❖ Quote ❖

Distance Education: *The amount of time spent in a live seminar is not a measure of learning. We all know that. It is a measure of the amount of time spent in continuing education activities and does ensure exposure to the content of the course. For our DE courses, in order to verify that the person spent the required amount of time, we test them with questions that ascertain that they watched the entire videotape. Since we grant continuing education units, we also test their knowledge and understanding based on the course objectives. The testing is done outside the time requirement. Does this mean our DE courses set a higher standard for completion than live seminars? I think so. Is this fair to the registrant? It does ascertain that learning took place.*

- Greg Ruff, Manager
  Engineering Professional Development
  Engineering Extension Service
  College of Engineering, Auburn University

(Continued from Page 16)

information that are innate to a Word document presented in the current and preferred format.

In other business

- The Board acted to replace Charles L. Eustis, PE, Director-at-Large, with Christopher G. Humphreys, PE.
- The status of the Section's application for a national State Public Affairs Grant was discussed.
- The deadline and process for submitting the Section's annual report was discussed.

(Continued from Page 17)

Branch Directors:

- Kimberly Landry, EI
- André M. Rodrigue, PE
- Deborah D. Keller, PE
- Kurt M. Nixon, PE

The photographs of the Board provided exclude the Branch Directors who are also serving as the branch presidents and their photograph is shown in this issue in conjunction with their branch officers.

— Calendar of Events —

December 2-3, 2004	**ASCE Seminar * on Design of Shallow Foundations, Houston, Texas.**
December 7-9, 2004	**ASCE Seminar * on Introduction to Streambank Investigation, Stabilization and Restoration, Houston, Texas.**
December 9, 2004	**Tulane Engineering Forum "Advanced Technologies for Homeland Security" in New Orleans. For more information visit www.eng.tulane.edu/tef or contact Jenny Kottler at (504) 891-1044 or jkottler@bellsouth.net.**
December 9-10, 2004	**ASCE Seminar * on Introduction to Streambank Investigation, Stabilization and Restoration, Houston, Texas.**
February 2-4, 2005	**ASCE Seminar * on HEC-RAS Computer Workshop for Unsteady Flow Applications, New Orleans, Louisiana.**
February 24-25, 2005	**ASCE Seminar * on Highway Bridge Design, Evaluation and Strengthening Using LRFD, Houston, Texas.**

***For more information, call ASCE toll free at (800)548-2723 or visit the ASCE web page www.asce.org.**

Community air monitoring network

By Yvette P. Weatherton, PE

Introduction

The Town of Norco, Louisiana is a small community with a population of approximately 3,600 and located approximately 25 miles west of New Orleans along the Mississippi River. It is surrounded by the production facilities of the various chemical, oil and gas industries dependent on the River. Consequently, this community is exposed to the attendant air pollution problems associated with industrial emissions.

Air Monitoring... Norco began in 2002 as a component of the *Good Neighbor Initiative* (GNI) of Shell Chemicals and Motiva Enterprises. The GNI was implemented with 3 primary goals in mind

- improve environmental performance of the Norco facilities
- assess the health and safety of the Norco community, and
- enhance the quality of life in the Norco community.

A component to assessing the extent of the air pollution in Norco and solving any problems so discovered was to establish a community air monitoring program — *Air Monitoring... Norco*. Using this program as a case study, it is presented to demonstrate some of the basic considerations for establishing an effective community air monitoring program.

Participants

Two teams of representatives from industry, government, academia and the community were formed to carry out distinct, but interrelated roles. One team was the *Technical Team* responsible for designing the air monitoring network and it included environmental engineers and scientists from Motiva Enterprises, an air monitoring expert from the Louisiana Department of Environmental Quality (DEQ), an environmental engineering professor from Southern University and representatives from the Norco community.

The other team was the *Communications Team* responsible for informing the citizens in the Norco community of the status of the project and conveying the air monitoring program results. It was comprised of public relations specialists from Shell Chemicals and Motiva Enterprises, a toxicology professor from Tulane University and citizens from the Norco community.

The process began with joint team meetings that enabled them as a group to identify the specific community concerns, establish the air monitoring objectives and determine an overall plan of action for implementing the project. A factor that makes this project unique is the high level of community participation. The team members from the community were present at all team meetings and played a significant role in the decision-making process. Care was taken to ensure that all of the community concerns expressed would be addressed satisfactorily.

Network design

The project was divided into two phases:

- Phase I - Preliminary Assessment and Siting and
- Phase II - Long-Term Monitoring.

For Phase I, 6 monitor sites were selected based on criteria and committee deliberations that will be presented in more detail. They were used to conduct a short-term air monitoring effort that spanned 2 months. This effort was to determine which air pollutant compounds were present in the ambient air and to measure their concentrations and variation throughout the community. This information was to be used directly to design the Phase II long-term air monitoring effort. More specifically it was used to determine the number of monitor sites that were needed and which pollutants would be targeted for the long-term air monitoring effort for which a minimum of 2 years of data will be collected.

Site selection

The Technical Team selected an independent contractor to identify and evaluate potential monitor sites. Alternate monitor sites were selected and evaluated based on the requirements that are set forth by the United States Environmental Protection Agency (EPA) in 40 CFR Part 58[1] Some of the more important considerations for locating monitor sites were:

- *Spacing from obstructions.* The monitor inlet must be placed at a distance from an obstacle of at least 2 times the height that the obstruction protrudes above the probe. There must also be an unrestricted air flow arc of at least 270º that includes the predominant wind direction having the highest concentration potential. This is because the probe is the inlet through which air passes from the atmosphere to the sampling device. Obstructions such as buildings can block the flow of air between the source and the monitor, resulting in a non-representative air sample.
- *Spacing from roadways.* To minimize interference from vehicular traffic, a minimum distance from roadways is specified as shown in Table 1 based on the distance from the edge of the nearest lane and the number of vehicles per day that use the road. In this study, the minimum distance required was 10 m.

Table 1. Separation distance between photochemical air monitoring sites and roadways (edge of nearest traffic lane)[2]

Average Daily Traffic (vehicles/day)	Minimum Separation Distance (m)
≤10,000	10
15,000	20
20,000	30
40,000	50
70,000	100
≥110,000	250

- *Spacing from trees.* To minimize the possibility of adsorption, monitor sites must be located a minimum of 20 m from the drip line. Trees also obstruct wind flow.
- *Additional considerations.* The distance from stationary air pollution sources and the prevailing wind direction from those sources to the community are determined if the community is located upwind or downwind of them. The monitor sites had to have electrical power and be secure from vandalism yet accessible to air monitoring personnel. The type of facility where a monitor site is located was also a major consideration. Schools, hospitals and elderly care facilities took precedence over general

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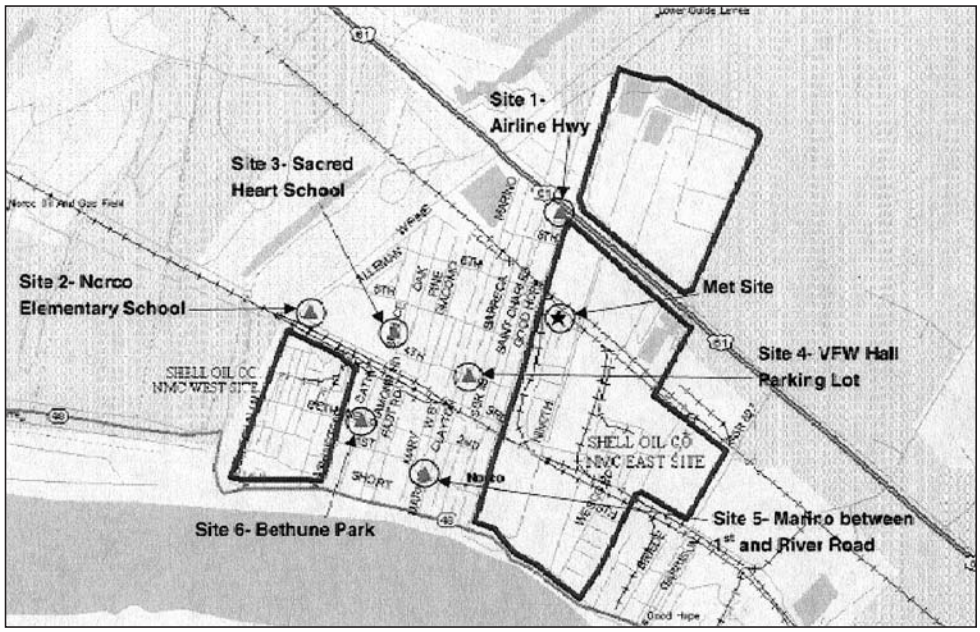

Figure 1. Phase I short-term study monitor site locations in Norco.[3]

(Continued from Page 19)

community locations because they allow assessment of air pollutant concentrations to which the most susceptible populations — children, elderly and ill— may be exposed.

The monitor sites were evaluated using a system that ranked each prospect based on how well it met the EPA and other criteria. The number of monitor sites for the Phase I short-term study was determined by the Technical Team with a great deal of community involvement. Although the experts felt that one or two sites would be adequate because of the size and geography of the community, the residents wanted a broader picture of the air pollutant concentrations in several areas of the community. Therefore, the 6 monitor sites as shown in Figure 1 were selected and located.

The data from the Phase I short-term study demonstrated that the air pollutant concentrations as shown in Figure 2 were essentially uniform at all the monitor sites with the exception of the site near Airline Highway (state route US 61). Therefore, it was indicative of only one centrally located monitor site required for the Phase II long-term study. Because of the concerns expressed by the community and the elevated air pollutant concentrations discovered at the Airline Highway monitor site, the Technical Team decided to use the VFW Hall as the primary monitor site location with supplemental monitor sites at the Airline Highway, Bethune and Marino locations for the Phase II long-term study.

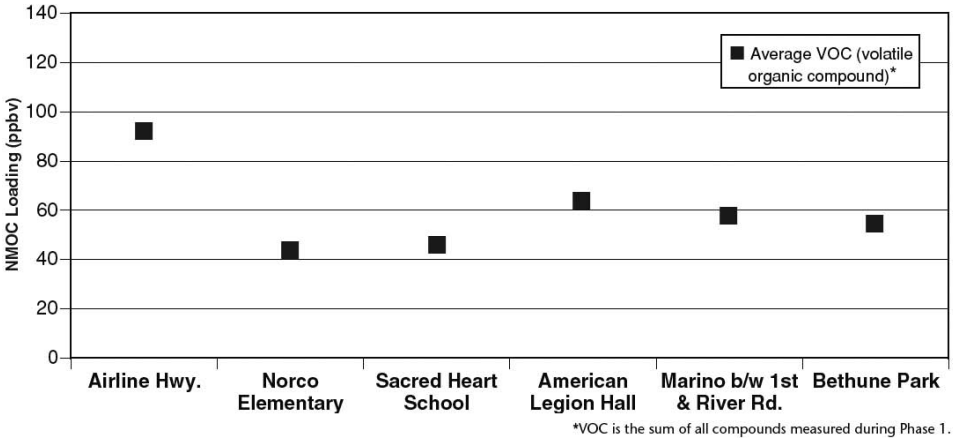

Figure 2. Average total VOC concentrations measured during the Phase I study.[4]

Sampling and analysis

The Technical Team prepared a request for bids and interviewed the independent contractors that submitted proposals to conduct the air monitoring and analysis. As a part of the interview process, the contractors had to specify their qualifications and their proposed approach to the study, and identify the laboratory and its capabilities that they proposed to use for air sample analysis.

During Phase I, the Technical Team assembled a list of 148 volatile organic compounds (VOCs) that were typical of industrial, mobile and natural sources in the community and that are regulated as toxic air pollutants (TAPs) by the DEQ. Using the EPA national schedule, a 24-hour sample was planned to be taken at each monitor site beginning at 9:00 am on every 6th day according to the EPA calendar for sampling dates.[5] This schedule allows samples to be taken on each day of the week over time, and provides consistency with the data for air monitoring networks throughout the country. The EPA guidelines were strictly followed during canister preparation, sampling and analysis. The air samples were collected in evacuated stainless steel canisters and were analyzed using Method TO-15 *Determination of Volatile Organic Compounds in Air Collected in Specially-Prepared Canisters and Analyzed by Gas Chromatography/Mass Spectrometry (GC/MS).*

Upon completion of the Phase I short-term study, the air monitoring data was used to complete the preliminary assessment and to design the Phase II long-term study. The data was specifically used to

- *identify target compounds.* From the list of 148 compounds measured during Phase I, the Technical Team selected 51 for the Phase II study. The target compounds were those identified as the most abundant species — making up approximately 85 percent of the total VOCs measured — and those compounds classified as TAPs that consequently have ambient air concentration standards in Louisiana.
- *compare the measurements at each site to determine whether or not the air pollutant concentrations were consistent across the community.* As stated previously, this helped the Technical Team to determine the number and location of the monitor sites required to obtain an accurate Phase II study assessment of the air quality in the community.
- *compare Norco's air quality to ambient standards to other cities.* The air pollutant concentrations obtained during Phase I were compared to the DEQ standards and to the annual averages in other cities as presented in Figures 3 and 4. It must be noted that the short-term measurements from Phase I are not adequate for making comparisons to the other locales or to the ambient air standards both of which are based on long-term annual averages. This comparison was done solely to provide a preliminary view of how the long-term air pollutant concentration measurements may compare.

During Phase II, the air monitoring schedule was modified such that data is collected at the VFW Hall site on every 6th day, and at the supplemental sites every 12th day. Further, a non-methane hydrocarbon (NMHC) analyzer was added at the VFW Hall site to provide continuous air monitoring for these compounds. It is configured such that if a specified threshold concentration is exceeded, it will trigger a canister to take a 1-hour sample. These samples are analyzed to help determine the sources of spikes in NMHC concentrations and when they occur.

Meteorological data collection is an integral component of both phases. During Phase I, historic annual wind roses — graphical representations of wind speed, direction and frequency measured at a given location — were used to determine the predominant wind directions for siting purposes. Wind data collected during Phase I proved to be representative of typical winds in the community. There are two meteorological stations currently in use. One is located on the Motiva Enterprises property, the other is installed at the VFW Hall site for the Phase II long-term study.

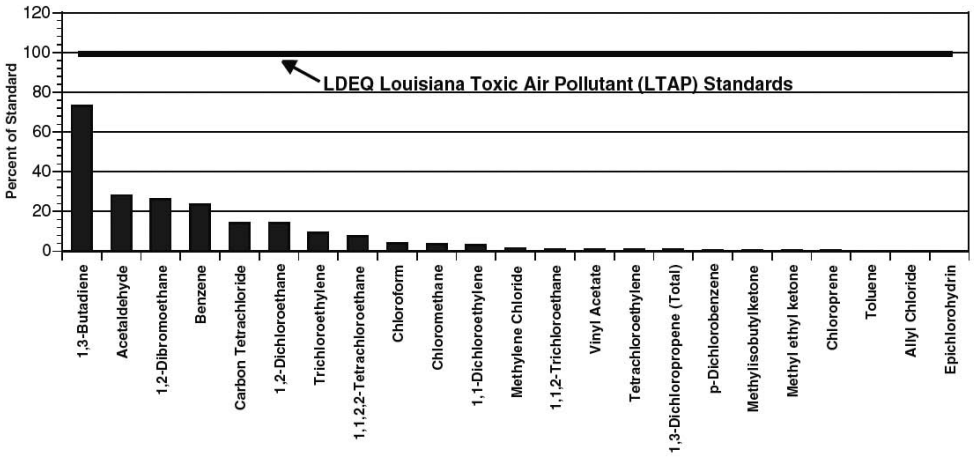

Figure 3. Comparison of the Phase I data with the DEQ Louisiana TAP standards.[6]

Summary

One complete year of data from the Phase II study has been collected and analyzed. In general, the findings are consistent with those from Phase I. Air pollutant concentrations are lower than TAP standards and the air quality in Norco is comparable to cities throughout the country. The only exceptions were two compounds — methylethylketone and acetaldehyde — which were measured at higher concentrations in Norco than in the other cities to which comparisons were made. Communication with Norco citizens is continuing through community meetings, newsletter websites and the information line that was established at Tulane University for the project. Future plans include having an independent external review of the process and the data. One of the anticipated outcomes of the review will be comprehensive risk assessment studies.

References

[1] United States Environmental Protection Agency, *CFR Title 40: Protection of the Environment Part 58: Ambient Air Quality Surveillance,* online, available from http://www.epa.gov/epahome/cfr40.htm

[2] Ibid.

[3] URS Corporation

[4] Motiva Norco Refinery, "*Air Monitoring... Norco* Newsletter", April 2003, online, available from http://www.norcorefinery.com

[5] United States Environmental Protection Agency, online, available from http://www.epa.gov/ttn/amtic/files/ambient/pm25/calendar02.pdf

[6] Motiva Norco Refinery, "*Air Monitoring... Norco Newsletter*", April 2003, online, available from http://www.norcorefinery.com

[7] Ibid.

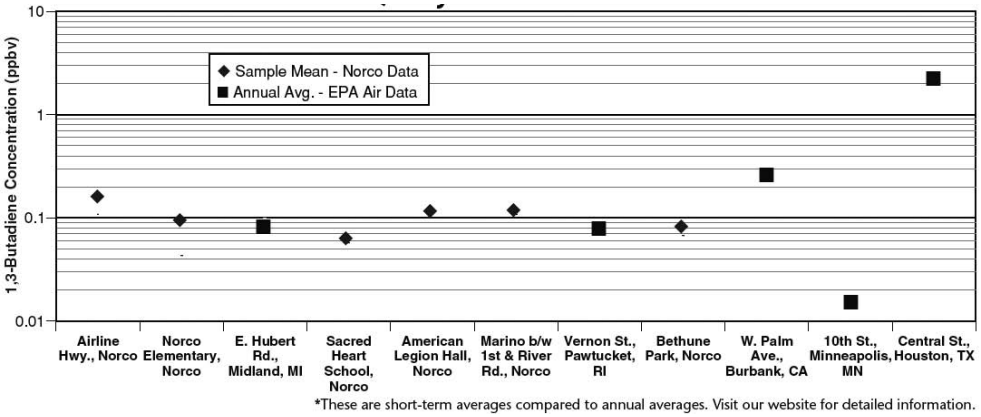

Figure 4. Comparison of the Phase I study data for 1,3 butydiene concentrations in other locations.[7]

Yvette P. Weatherton, PE, earned her BS degree in civil engineering from Southern University in 1993, her MS degree in environmental chemistry from Southern University in 1995 and her PhD in engineering and applied science (environmental engineering) from the University of New Orleans in 2000. In 2002, Weatherton became a licensed professional engineer (environmental) in Louisiana. She has been employed by Southern University at Baton Rouge since 1995 (including 2 years of academic leave) and is currently an assistant professor of civil engineering. She was employed from 1999 to 2000 as a graduate research assistant in the Department of Civil and Environmental Engineering at the UNO. Weatherton has several honors and awards, most recent of which are the Southern University 2003 College of Engineering Teacher of the Year and the 2002-2003 Most Outstanding Civil Engineering Faculty Member.

- Observations -

Engineering Trends:

It would seem that the applications of much of the conventional civil engineering theory taught have been developed into ubiquitous libraries of proprietary software. Graduating civil engineers 2 to 3 decades ago were expected to manually apply the theory to obtain conventional solutions. The time-consuming and sometimes tedious computations and processes were necessary to *manually* solve a problem and they consumed much of the engineer's early career effort. It was not uncommon to select a preliminary design that was *reasonably* conservative to assure that the time-consuming and tedious solutions worked the first time. There were — and to some degree still are — typically clear divisions of labor in engineering between the administration and the technology practiced by senior and junior engineers respectively. The most important opportunities application software provide today are

- More efficient and different design options can be subject to comprehensive, rapid and complete analysis with a little up-front effort and none of the old manual grind.
- More time is available for junior engineers to become involved earlier in administrative duties and for senior engineers to continue to expand their experience and exercise their previously honed engineering skills in problem-solving.

Through the added time available, the most significant opportunity is for junior and senior engineers to work toward the important goal of becoming more involved in the humanistic aspects of the profession. The understanding and importance of effective relationships can be cultivated during education and practiced earlier in one's career. They may include team participation, team leadership, client relations and political activities. - *Editor*

Technology and Evolution:

Columnist Joan Ryan conjectures in an oped piece (Baton Rouge *Advocate*, 8/19/03) about the notion that "Different environments drive evolution" by the way the successful mutations of the species adapting to the ambient conditions. She noted that:

"We (humans) make the environment adapt to us... If the climate is too hot, we flip on the air conditioner. Too cold, we fire up the heater. We turn deserts into lush landscapes. We fix what Mother Nature is too slow to fix. We have... glasses to correct our vision, artificial hips, knees and hearts to replace body parts... We seem to have shrugged off nature's delicate touch and taken matters into our own hands. Won't our artificial tinkering eventually interfere with the natural course of human evolution?"

In response to her concerns, David DeGusta at the Laboratory for Human Evolutionary Studies at the University of California at Berkeley observes:

"Being able to alter the environment and adapt through behavior don't really run counter to evolution. Those abilities are just, themselves, evolutionary adaptations."

Greg Niemeyer, a professor of art, technology and culture at the same institution adds, "Evolution is no longer limited to nature. It has to include technological adaptation." I don't know if I share Ryan's conclusion that

"...our technological adaptation is nature, driven by the primal instincts shared by... every living thing: To endure and to push the boundaries of possibility."

It is my belief as a civil engineer that evolution for all species — at least in part — is driven by natural selection that is purely the survival and reproduction of those mutations and behaviors that by *chance* are most successful in adapting to the environment. Technology is a *conscious* behavioral adaptation that creates an environment within an environment that changes the ground rules for successful behavior and/or mutation. Technology is less typically developed by all individuals in the human species and more typically *developed* by a specialized, often cooperating segment within — such as engineers. Successful technological evolution is measured by successful implementation of a technology by a broad segment of our species. -*Editor*

Editor's Journal

By James C. Porter, PE

Membership retention

I was recently reading an excerpt in the *Section Informant* (9/1/04), the online newsletter for the section and branch leadership, where I was impressed by the obviousness of the statement, "*Remember — members will not automatically renew their membership each year — they need to see the value of being an ASCE Section or Branch member.*" Though this was written around concerns about retaining members who have recently joined the ASCE, it should be clear that it really applies to all ASCE members — even those of us who do seem to *automatically* renew our membership each year without consciously measuring the value we receive. I would further suggest another obvious point that measured or perceived value applies to *all* aspects of the ASCE — not just the actions or services of its sections and branches.

Over the years, as an ASCE member, I have mostly measured the value of my membership — when I think about it — based almost exclusively on the quality of the services I receive from my fellow branch and section members and the satisfaction I have gained from the substantive opportunities I had to serve my fellow branch and section members. This is not to suggest that I discount my previous service on national committees and technical panels, and my opportunities to publish in the ASCE technical journals over the years. It is to suggest that I uniquely do not consider these events as a substantial or ongoing measure of the perceived value of my ASCE membership.

I am reminded of how blind-sided I was when informed that not all ASCE members share my motives and more particularly my standards of measuring the value in their membership. I was informed that there are many ASCE members who are typically but not exclusively in academia that see little value in the services and activities of their assigned section or branch to the extent they seldom join or participate. Their motive and interest in ASCE membership is

(Continued on Page 23)

The ASCE Strategic Plan

I responded to the ASCE's invitation to its members to review the June 2, 2000 version of its proposed strategic plan (vision, mission and goals statements) and to provide comments to the committee responsible for developing it. It is posted on the ASCE website and is otherwise available in a booklet on request from the ASCE headquarters. My critique is shared here because it is suspected that there are many significant ideas and opinions among us that should be shared with the committee. It is hoped that my thoughts herein will act a catalyst to inspire your unique ideas and response. Though the ASCE strategic plan is intended to be a "living" document regularly revisited to best serve the ASCE membership, it is a 5-year strategic plan due for a major review and rework in 2005. Please consider sharing *your* thoughts with the committee strategicplanning@asce.org and possibly with your fellow members as it is done here.

The Vision: *Engineers as global leaders building a better quality of life.*

In reality, I believe that the ASCE buzz word "global" applies only to some of the immediate national leadership that probably represents the active interests of a very small portion of the membership. If this is true, then this vision statement does not apply to the vast majority of the ASCE membership who do not *participate* in global markets, politics, or other socioeconomic issues any more than they participate in global weather patterns. Most individual engineers simply work in — and are affected by — the globalizing socioeconomic environment. As an *individual*, they do not and will not exercise global *leadership* in an environment where they are incidentally its beneficiaries or victims and little else.

The focus on the global marketplace and investments planned by the ASCE in this area may reflect a version of corporate welfare in using Society resources to promote and support the global business interests of its national leadership. This is not to imply that the ASCE does not have a legitimate *organizational* leadership role. The ASCE should be assessing the global marketplace in the context of the career interest of its general membership. Consider the following if it is desirable to include the majority of the membership now excluded in the vision statement and to keep the focus on the individual members, what they do and over what they actually exercise control:

Engineers as leaders and stewards building and preserving a better quality of life.

This recognizes the most prominent, historical role of engineers in the United States as leaders/builders and their emerging and equally prominent role as stewards/preservers of existing facilities (the infrastructure) and the environment. Leadership is without reference to the stage on which it is played out; locally, nationally, internationally, globally, intergalacticly or universally. Relegate global issues to the goals statements as they have already been included.

The Mission: *To provide essential value to our members, their careers, our partners, and the public through:*

- *Developing leadership*
- *Advancing technology*
- *Advocating lifelong learning, and*
- *Promoting the profession*

It does not appear that *their careers* reasonably go in a series with *members, partners and the public*. It would appear that if *essential value* is provided to our members, it would cover their careers as one of several issues. In the bullet items stewardship is not expressed. However, if it is included in the vision statement as proposed it would be effectively covered. The ASCE is more than *advocating* lifelong learning it is *supporting* it. Actually lifelong learning is but one issue in professional growth or development though individually a recent high profile issue. I would recommend revising the mission statement as follows:

To provide essential value to our members, our partners and the public through:

- *Developing leadership and stewardship*
- *Advancing technology*
- *Supporting professional development, and*
- *Promoting the profession*

The Goals: (Notation: Words added and words ~~deleted~~)

Develop leadership and stewardship *through opportunity and encouragement to broaden our members' perspectives and participation, and to influence public policy* ~~*to enhance their career growth*~~*. (...to influence public policy was moved from Promote the profession...)*

1. Position ~~our~~ members for success by providing leadership opportunities, training and tools.
2. Encourage members to participate as leaders in society.
3. Champion responsible infrastructure, environmental and socioeconomic programs and projects such as sustainable development. *(Move to support professional development.)*
4. ~~Promote sustainable development in project planning and implementation activities~~. *(Covered in item 3.)*
5. Provide governance that encourages the participation of the profession's leaders and facilitates the development of future leaders.
6. Promote greater public awareness of engineering issues relative to public health and safety, including natural disasters. *(Move to promote the profession.)*
7. Help members successfully compete in the global economy. *(Move to promote the profession.)*

Advance technology *to enhance infrastructure and environmental stewardship through competent, competitive, high quality civil engineering services* ~~*quality, knowledge, competitiveness,*~~

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often participation in national technical activities — particularly those centered around the *publishing* in the various ASCE technical journals to avoid *perishing* on the job. As such, they are interested in networking with their peers on the technical committees and not particularly interested in networking among the practicing engineers in their section and branch communities.

A significant issue concerning membership retention in the ASCE may be a reflection of the precipitously dwindling membership in the National Society of Professional Engineers recently reported. I believe that this speaks volumes to membership retention related to perceived value and what may be a shared problem because the growth rate of the membership in the ASCE has stalled nationally. There are strong similarities that I perceive between the governance of the ASCE and the NSPE. The most substantial of which is the historic and similar character and content of their national leadership, and the consequences relative to membership retention from the resulting similar national actions and policies they enact.

The considerable commitment of time and resources required to effectively participate in the volunteer service of the national ASCE elected leadership is such that national office is generally confined to those who can play. They are the principals and high level executives in private practice. They are among the few who have unfettered access to the perquisites, the financial resources, the time away from work allowed and the administrative services to avail themselves of the opportunity to effectively participate in such volunteer activities. Their resulting profound influence on the policy and the actions of the ASCE ultimately *serves* the profession from their unique perspective that is necessarily in their best interest and can be perceived to the detriment of some.

Confirmation of this observation came to me as a cub engineer employed in government. It was crystal clear at that time because I actually read the ASCE Code of Ethics when I joined in 1971 to discover that it was little more than punitive rules directed toward engineers employed in private practice. When I discussed this with senior engineers in government, they confirmed my observation and further explained their perception of the biases at the time in the ASCE and the NSPE against engineers in government.

Confirmation of their perceptions came when, more recently, the ASCE quickly, clearly and decisively with substantial resources supported the engineers in private practice when the engineers in California state government sponsored a referendum that would favor government engineering services to the state over private practice services. Though I personally and vehemently disagreed with the effrontery of the referendum, I was also clearly aware of the struggle between the engineers in government and private practice over the division of engineering services long before this. In Louisiana — and I suspect most other states including California — the result of this struggle is preordained if based on nothing more than the sum of the political *contributions* made by each faction to their elected representatives. In my estimate, the ASCE clearly committed an act in this event that in football was once the infraction, *piling on.*

Why is there an inordinate under-representation of engineers in government and industry and any other engineering employment situation other than those in private practice whose firms typically pay their expenses and otherwise facilitate their participation in the ASCE? The noted exception is those in academia who are not usually perceived to compete with engineers in private practice to provide services. They *desperately* need and support the refereed paper environment of ASCE technical journals as an almost exclusive publishing outlet and the technical institutes to network with their peers usually at their university's expense.

The question posed is apparently a conundrum unique to the deaf, dumb and blind *act* of the ASCE and NSPE leadership and it gives me cause for great cynicism. To claim not to see the clear connection between the policies and actions of the societies and their membership retention among the engineers in employment situations that are perceived to compete with those in private practice in providing engineering services is clearly disingenuous. For the ASCE, it is somewhat like hitting yourself over the head with a hammer and then wondering why you have a headache. No one in our community can claim to be this stupid and expect anyone else to believe it.

I believe that the NSPE and its affiliated state societies have the same problem except that they create a more hostile environment demonstrating much more bias and callousness. They essentially have no tolerance for dissent in connection with their private practice agenda. I do not understand why either the ASCE or the NSPE should expect a subsidy through membership dues naively paid by their undeclared enemies in the engineering profession. On this basis, I guess you can consider me — a government-employed engineer — a naive member. But not entirely.

In Louisiana, I may have a unique opportunity. State-employed engineer members of the LES experienced a history of serious practice issues that were brought in good faith to the LES — the NSPE affiliate — seeking support. If a response required budgeting monetary resources to which they had substantially contributed, it was routinely denied. They formed the Louisiana Society of Professional Engineers in Civil Service to effectively address their issues. As a dues-paying member of the LSPECS and one of its past elected leaders, I believe it behaves more like a union than a professional society. However, I also believe that this 400-member society significantly contributes to and is responsible for the professional environment in state government service where engineers can practice much more effectively than before. It is an environment that I believe would otherwise not exist if it had been left up to the LES.

I believe that poor membership retention in the NSPE and its affiliate state societies is seriously exacerbated by their strong private practice agenda bias, and the inordinate power and intolerance of dissent exercised by their private practice-dominated leadership. The extent of this behavior appears to foster a hostile environment that preempts most if not all of the limited attributes these societies claim offer their rank-and-file member.

Luckily, the ASCE offers more diverse membership attributes, particularly in the technical area, that are not politically connected to economic competition with the engineers in private practice. This somewhat insulates it from the decay the NSPE is experiencing. Nonetheless, I am personally disappointed by the recent cross pollenation between the NSPE and the ASCE in the hired leadership of the ASCE and the resulting attitude shift that I sense and suspect comes with it.

The LES experienced a substantial decline in membership during an economic downturn in the 1980s. As a cost-cutting measure, many employers ceased to subsidize their employees and to facilitate their participation as members of the LES. In the aftermath, the question was prophetically framed by a thoughtful and well-respected member employed in private practice. The question defined the issue long before it was on my horizon. He suggested that the LES was consciously or unconsciously in the process of deciding whether to be a large, somewhat chaotic, membership society attempting to represent the breadth of the engineering profession in Louisiana or a small more harmonious membership society representing only the narrower interest of a few *dedicated members.*

It did not occur to me then but his reference to dedicated members was probably synonymous in his thoughts with engineers in private practice. It appears this decision may have been made consciously or unconsciously by both the LES and the NSPE. Based on its recent actions, the ASCE could and probably will attempt — consciously or unconsciously — to do as badly.

Commentator Jim Hoagland (9/9/04) offers this insight:

> Nations survive from the bottom up. Anti-guerrilla campaigns, learned commission studies or new cabinet-level departments do not save countries in crisis. What saves them is social cohesion, and the awareness of a common determination of people to protect their shared future... (This) provides them the ability to overcome the anger, hatred and fear that are the terrorists' primary weapons.

I believe that a simple conclusion applicable to this discussion can be drawn directly from Hoagland's observations aside from the terrorist threat focus. The ASCE and the NSPE may have consciously or unconsciously chosen their course based on the *social cohesion* and a common determination to protect the *shared future* of the engineers in private practice to the detriment of all other engineers perceived to be their competitors. I believe that both societies can survive easily from *the bottom up* as they are or as they may be becoming if they openly acknowledge their real goals, cut their losses and get on with life recognizing what is already becoming clear. They do not truly intend to equally represent *all* engineers because some are more equal than others. I maintain the lame hope as a member of all of these societies that they would *consciously* choose to be *bigger* and *better* than this from the bottom up.

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~~*and environmental stewardship*~~.

1. Identify future needs of the marketplace. *(Move to promote the profession.)*
2. Foster research for the development of new technologies, capabilities, and efficiencies.
3. Facilitate the transition ~~movement~~ of innovation into practice.
4. Be the primary source of technical information.
5. Enhance the understanding, delivery and exchange of technical information.
6. Facilitate the development and responsible application of new technologies ~~and processes~~.
7. Stimulate cooperation on technical issues with other industries.
8. Lead the development and promotion of technical standards for worldwide application.
9. Promote quality in engineering practice. *(Move to support professional development.)*

Support professional development ~~***Advocate lifelong learning***~~ *to aid our members' continued growth throughout their careers.*

1. Broaden the learning experience.
2. Provide access to comprehensive educational programs ~~that enhance opportunities for professional growth~~.
3. Provide access to new learning technologies.
4. Refine the educational requirements for civil engineers and technologists.
5. Set standards for continuing professional development.

Promote the profession *throughout society to enhance its stature* ~~*and to influence public policy*~~.

1. Celebrate members' achievements and publicize their contributions to society.
2. Expand the Society's global network through partnerships and coalitions.
3. ~~Promote diversity within the profession.~~ *(Covered in item 4.)*
4. Attract to and retain in the profession talented and diverse individuals ~~to the profession~~.
5. ~~Increase the public's awareness and appreciation of the profession's contributions to society~~. *(Partially covered in item 1 and a restatement of the goal.)*
6. Be recognized as the leader on issues of public policy affecting the profession. *(Move to develop leadership.)*
7. Promote increased political involvement by civil engineers ~~engineering professionals~~. *(Move to develop leadership.)*
8. Participate in strategic alliances to influence legislative and regulatory issues. *(Move to develop leadership.)*

Some of the several items above appear to be only vaguely related to the main goal under which they were listed and may have been indiscriminately inserted to justify existing and preordained ASCE programs rather than evolved as a logical and legitimate outgrowth of the stated main goals. It is disappointing that *directly* promoting the tangible professional licensure and increased compensation in salaries and fees consistent with the perceived value of civil engineering services that appeared in previous strategic plans is replaced by the intangible *global* this and *global* that.

Engineering isn't what it used to be

> Are civil engineers prepared to be engineers? ...The most difficult part of professional engineering practice entails mastering the real-life issues, issues that generally do not figure in formal civil engineering education and have more to do with areas such as human resources, personnel management, communications, negotiations, cultural issues and leadership.
>
> (*CE News*, October 2002)

There is a key subject common to these independent topics. It is relationships. If relationships are the most difficult part of an engineer's practice, I do not believe that attending a few nifty how to... sessions during some engineering conference or reading a book on the subject is going to cure the problem. Yes... I said — and I meant — cure.

The inability to function well in relationships, if it exists, is usually pervasive in all areas of one's life and not just limited to the workplace. I believe that this condition is an acquired habit brought on by the randomness in living life and an individual's predilections driven by temperament and experience. To concisely put habit in perspective, consider the adage

Sow a thought, and you reap an act;
Sow an act, and you reap a habit;
Sow a habit, and you reap a character;
Sow a character, and you reap a destiny.

Habits appropriate and inappropriate — as they may be perceived — are embedded in one's character and for this reason they are not easily eliminated or changed by simple recognition followed by some whimsical intention to change. From my own experience, changing any ingrained habit is an excruciatingly difficult and long journey that often requires more motivation, and discipline than I can usually muster alone and it takes less than a minute to fall into relapse.

I am convinced that dysfunctional people tend to be attracted to mathematics/science-based curricula like engineering because their processes require more undivided attention and discipline to assimilate than most. And the attention of those not suffering from the joy of functional relationships is usually not that divided to begin with. For them, it is easier to focus on a curriculum that features dysfunctional instructors — research wonks — and the prospect of entry level employment opportunities generally devoid of complicated relationships such as would be expected up front in practicing law, medicine and politics, for instance.

The inevitability of climbing the career ladder in civil engineering to project manager, to program manager, ad infinitum... will quickly reveal the character flaws (inappropriate habits) for this work that are associated with dysfunctional relationships. With the extensive library of proprietary engineering technology software available today, there is less opportunity for a career-long refuge serving as someone's number cruncher in a design office. The number crunching is computerized. It is all but instantaneous and, frighteningly, it seems to require little competence in the basic engineering principles to execute the software — if not to execute it correctly. With no refuge, early career advancement will leave a lot of leisure time for important relationship roles for which engineers may not have the assets by predilection or by education to play.

Sadly, or maybe happily, depending on your perspective, there appears to be less room in the civil engineering profession for the dysfunctional, master technologist that in many respects has been effectively replaced by the ubiquitous personal computer and its proprietary software some years ago. Maybe beefing up the civil engineering curriculum with humanities that support understanding and pursuing functional relationships will drive off dysfunctional students. But there is no guarantee that it will attract functional students to replace them.

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ered with soil or an acceptable substitute on a daily basis to reduce the accumulation of excessive leachate, the odors and the attraction of birds and rodents.

Final cap

The waste is placed in the landfill to specified slopes and heights that are designed to prevent slope instability. Once the specified height and slope is reached, the waste is capped with a final cap system that somewhat resembles the liner system, only upside down in orientation. The first layer of the final cap system over the waste is a granular medium that allows for the flow and collection of the methane gas that is generated by the waste as it degrades. Similar to the leachate collection system, the gas collection system provides an upward gradient collection system to allow the methane gas to rise to a collection point at the peak of the landfill where the

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gas is typically routed to a flare system.

A HDPE geomembrane followed by a clay liner is constructed over the granular medium to form an impermeable composite liner system and a barrier for the gas collection system. This barrier is also constructed to prevent the percolation of stormwater into the waste mass after the closure of the landfill. A final layer of topsoil placed over the liner system to establish a vegetative cover that is prepared and seeded to minimize erosion.

Monitoring

Every completed municipal solid waste landfill must be provided with a series of wells to monitor for the release of the methane gas and leachate from the landfill. The gas wells are installed in the unsaturated soil horizon that surrounds the landfill, and the groundwater monitor wells are installed to monitor the water in the shallowest permeable unit below the landfill. Samples drawn from these wells on a routine basis and analyzed for any indications of a release from the landfill. In the event a release is detected, the regulations provide for an aggressive program of corrective action that includes source delineation and correction.

The result of these stringent landfill design, operation and monitoring standards has been excellent. There have been no observed releases from any of these landfills documented in their more than 10-year history of operation. Of course, only the test of time will lead to the discovery of any inadequacy or unintended consequences — positive or negative — concerning the design standards intended to provide a perpetually safe disposal system. All of the monitoring information that has been collected to date appears consistent with performance expectations.

The Future

Engineers did not stop learning or thinking after the promulgation of the sound, specific and somewhat prescriptive regulations for municipal solid waste landfills. There has been and continues to be a great deal more learned about landfill design, construction and management through the experience gained by applying the regulations and observing the results. This improved practical knowledge and understanding of landfills through the practice of engineering design, construction and management has led to changes in the thought processes, the discovery of significant opportunities and the implementation of more effective and practical applications that remain consistent with the spirit and the intent of the regulations.

Geosynthetic materials

The technological advancements in the products manufactured by the geosynthetics industry now allow the replacement of the typical impermeable earthen components previously specified in landfill construction with the various impermeable geosynthetic materials available. As an example, if a landfill site is located where little or no clay is available to construct a liner, a geosynthetic product referred to as a *geocomposite clay liner* (GCL) is a viable alternative. The GCL is a manufactured product with powdered bentonite clay sandwiched between two non-woven geotextile liners. The GCL can simply be rolled out on a prepared subgrade and overlapped to form a low permeability barrier to replace or to enhance the recompacted clay liner component. The powdered bentonite can be uniformly attached to — and contained inside — the HDPE liners, creating a composite liner system with the one product.

Sands and gravels used for conventional leachate collection layers can also be replaced with a geosynthetic product referred to as a *geonet*. The geonet is a highly permeable synthetic matrix that can facilitate the planar flow required for leachate collection when placed above the impermeable HDPE liner. The geonet can be manufactured fastened to — and composite with — the HDPE liner. The geonet in conjunction with the HDPE liner forms a very good filtration system that can hold out the solids from the waste and the subgrade and allow the fluids to rapidly pass to the leachate collection sump.

In recent years, there has been a pronounced growth in the use of these innovative geosynthetic products in solid waste landfill construction and landfill construction in Louisiana has been part of this futuristic trend. The geosynthetic products, the impermeable GCL system and the highly permeable geonet leachate collection system are commonly used in Louisiana to replace or enhance the recompacted clay liner and replace the sand and gravel layer leachate collection respectively. The regulations set a very stringent acceptance criterion that requires a designer to demonstrate that the proposed alternative geosynthetic systems will be as protective of human health and the environment as the conventional liner and leachate collection systems. The variation from conventional systems requires permit modifications that include public awareness and participation in the decision-making process.

Bioreactor landfills

Perhaps the most exciting change that the future appears to hold is the transition in the thinking of the method of waste storage and disposal from the *dry tomb* to the *wet tomb* concept. All prior regulation and the design standards are for dry tomb landfills. They prevent the ongoing exposure of the waste mass to liquids. This regulatory criterion is based on the reasoning that the most toxic of the wastes would be rendered safely disposed in place if there is no medium — liquid — to possibly transport their constituents into the environment. As a result, the provisions for daily cover and for the final cap that is as impermeable as the liner system to minimize the introduction of liquids have always been a part of the regulations for municipal solid waste landfills.

The problem with this approach is that wastes are being stored in what are considered and intended to be *perpetual* landfill sites and yet there is a continuing unending waste stream that will result in a growing and unending need for more land for future perpetual landfills. Over the past decade, a significant amount of research has been dedicated to the evaluation of waste *biodegradation* in both aerobic and anaerobic environments. However, effective biological degradation requires the introduction of water into the waste mass — contrary to the dry tomb regulations for landfill design that prohibit or minimize the introduction of liquids into the landfills.

In response to the promise this research appears to offer, the EPA has very recently proposed to add a new section to the Criteria for Municipal Solid Waste Landfills. It will allow the states to issue research, development and demonstration (RD&D) permits for wet tomb landfill operations that are at variance with portions of the dry tomb criteria. This is provided the landfill operators can demonstrate that the proposed wet tomb operations will not result in an increased risk to human health and the environment.

The wet tomb alternative is to promote innovative technologies for municipal solid waste landfills. The reason for the RD&D permits is to allow the reintroduction of the leachate from the leachate collection system into the waste mass to accelerate its biodegradation. The wet tomb landfill concept has been coined the *bioreactor landfill.*

It is anticipated that there will be an increase in the use of bioreactor landfills in the future because they provide a very efficient means to manage the leachate, and the biodegradation process causes a substantial reduction in the volume of the waste mass in time. There is also the prospect that long-range reduction or neutralization of the toxic qualities of the waste mass may lead to the feasible recycling of the municipal solid waste landfill sites.

It is anticipated that much more attention will have to be placed on the design and construction of the leachate collection system for the bioreactor landfill because of the increased volume of liquid that will be transported through a landfill cell. Daily cover placement will require greater scrutiny to allow for the proper flow of fluids through the waste mass. More elaborate methane gas collection systems will be necessary because the bioreactor landfill will generate much higher volumes of gas.

Waste to energy

Another innovation associated with the municipal solid waste landfill and related to the bioreactor landfill is the methane gas emissions being collected and used for power generation of electricity. This *waste-to-energy* concept is another practical sense trend that makes beneficial use of the otherwise troublesome methane gas that will be generated in much greater quantities. The methane gas generation from many high capacity landfills can provide a fuel source to generate large amounts of electricity. The conversion of landfill gas to electricity requires a large capital investment. However, the bioreac-

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tor landfill with its long-term prospect of generating large volumes of gas redefines the economics for this capital investment making electric power generation more feasible.

Summary

Only 30 years ago, municipal waste dumps were a large and growing liability for environmental degradation. Now well-regulated, municipal solid waste landfills are a source of controlled preservation of human health and the environment. The future appears to hold the realistic expectation of feasible electric power generation from the methane gas generated and the potential to reduce or neutralize the toxic contents of the waste mass and the possibility of recycling the landfill sites. This is certainly an example of how engineers have teamed with communities and with the regulators, using innovation and the entrepreneurial spirit to take the proverbial lemon and make lemonade.

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