Origin from Massive Yellowstone Volcanoes?

Ash Deposits Can be Deceiving

By BARRY FRIEDMAN
EXPLORER Correspondent

In and around the Gulf of Mexico one can expect to find an unruly mix of jazz, heartache, gumbo, prolific petroleum reserves and, if a new study is to be believed, volcanic ash.

And this volcanic ash, according to one researcher, has the potential to contribute to the rising cost of petroleum exploration by playing a kind of cat and mouse game with the industry.

The theory, according to AAPG member Matthew Totten, an associate professor at Kansas State University, is that seismic readings of ash deposits look a lot like those of petroleum reserves and, to put it simply, it’s tough to tell the difference.

And, apparently, the Gulf has been collecting this ash for millions of years.

“In the beginning we were a little incredulous ourselves,” says Totten, who recently authored a study that indicated large beds of volcanic ash are in the Louisiana bayou.

Totten believes that massive volcanic eruptions (3,000 to 4,000 times more powerful than Mount St. Helens) that occurred two million years ago in what is now known as Yellowstone National Park covered parts of the Midwest, including Kansas and Nebraska, made its way, via the Mississippi River, to the Gulf of Mexico.

(As to the effects of Mount St. Helens, Totten says it was too small of an eruption and too far west to be significantly concentrated in the Mississippi River.)

See Volcanic Ash, page 30

The Ultimate LAS Data Conversion, Calculation and Viewing Tool

Imagine the ability to easily perform a wide variety of often-required LAS data conversion, file merging, log viewing and printing operations, each in just a mouse click or two. Imagine no more.

Here are six of the ways that LAS tools can make your work with LAS files much easier:

1. POWERFUL CONVERSION UTILITIES
   Data conversion tools to perform Depth Shifting, Curve Units Conversion, Curve Smoothing, Null Value Interpolation, Depth Interval Extraction, Depth Step Conversion, Depth Direction Reversal, Depth Reference Conversion, TVD/MD Conversion, Depth Units Conversion, Curve Extraction, Curve Renaming, and LAS Version Conversion are just a click away. Create workstation-ready files in seconds.

2. FAST and EASY FILE MERGING
   Whether you receive multiple data runs from your logging contractor or you want to merge core data with your logs, the File Merging function will prove to be a time and hassle-saving utility for you over and over. Curve join points can even be picked graphically!

3. INSTANT LOG VIEWING, TOPS PICKING and PRINTING
   Instantly see your logs in any format or scale just by clicking on the “Visual Log” tab. Pick and edit formation tops graphically on screen and apply curve shading to highlight values of interest such as cutoffs and pay intervals. Print logs in any scale and even create graphics files for inclusion to geological reports and cross-section applications.

4. PERFORM MATH CALCULATIONS
   The full-featured Perform Math utility in LAS tools is so full of functionality it is even used by many to do basic log analysis. Build your own equations or use the ones provided such as the Water Saturation equation using the Archie formula.

5. INTERACTIVE DATA VERIFICATION and MODIFICATION
   The unique spreadsheet-style interface of LAS tools provides instant visual verification of the changes you make to your files. Click on the appropriate “tab” to quickly see the required section of your LAS files. It even calculates statistics enabling quick mathematical data verification.

6. ROBUST LAS and ASCII FILE READING
   This time-tested routine automatically handles many inconsistencies and variations found with LAS files. It even reads zipped files, UNIX files and wrapped files and converts columnar ASCII files to LAS format with its “ASCII Import Wizard.”

E-mail us today at sales@logtechcan.com for immediate delivery of your free trial copy.

LogTech (Canada) Ltd.
668, 10201 Southport Road S.W., Calgary AB T2W 4X9
Tel: (403) 238-6681 Fax: (403) 201-1855
Web Site: www.logtechcanada.com

DECEMBER 2006
"I am able to do a complete geological interpretation quickly and without having to send anything to drafting to get a final product. The efficiency created by NeuraSection enables me to complete many more projects than I would using conventional methods."

Scott M. Daniel
President, Seven D Oil & Gas, Inc.

Any Prospect ....... Any Data ....... Anywhere
We'll show you, just call 1-800-364-8728.

Neuralog, Inc.
1-281-240-2525  1-800-364-8728  www.neuralog.com
The magnitude of these eruptions is outside normal experience,” Totten said. “When you find thick deposits in Kansas, halfway between Wyoming and Louisiana, you realize that the drainage system must have been full of ash for some time.”

The Fresh Connection

Totten, a former University of New Orleans professor who left for KSU shortly before Hurricane Katrina slammed into the Gulf Coast, has been studying the ash-bayou connection for years. “Volcanic ash was spread over a tremendous area of the United States, and has been recovered from a wide variety of locations in the western U.S., the Great Plains, the Gulf of Mexico and even the Pacific Ocean. The ash outcrops in Kansas show evidence of a system overwhelmed with ash… and record a time when the Mississippi River drainage system was literally choked with ash.”

Totten says that over time, the ash reached the depocenters in the Gulf of Mexico.

“Based upon the paleomarker we used in our most recent study (GCAGS, 2006),” Totten said, “and assuming it is correctly dated, then the maximum amount of time from eruption to final deposition in the deepwater GOM, is about 100,000 years.” Why this is important, is that if the Gulf is filled with ash and if that ash “looks” like oil, industry may spend millions of dollars looking—and drilling—in the wrong places.

“The seismic reflection of sands with about 20 percent ash seems similar to a hydrocarbon-rich sand,” Totten said, adding that not enough is known about the minimum amount of ash within a sand to lower the density enough to generate this response.

While saying one of the byproducts of finding all this ash is how much it will likely affect climate, water chemistry, etc., Totten believes the more pressing implication to the industry is the possible misinterpretation of an ash-rich bed as a DHI (direct hydrocarbon indicator). “The ash is very low density,” Totten said. “A mixture of low-density ash within sand can give an amplitude anomaly similar to hydrocarbon-bearing sand. So avoiding this is important.”

continued on next page
A Tough Sell

At first, his findings were a tough sell. “Some of what we were battling was the conception that all of the ash was airfall, instead of reworked airfall into the river system,” he said. “Airfall deposits are much too thin to be found in the 300-foot-thick beds we see. Airfall ashes from Central America are reported in the Gulf, but millimeters thick—and we can’t think of a mechanism to rework the ash up the continental slope into the deposits we see. “I think some of the well-publicized TV documentaries on super-volcanoes have helped. Once you recognize the magnitude of these eruptions, the occurrence of ash in the Gulf of Mexico seems inevitable, at least to me. “Also, as more work on the hotspot became widely known, and as we also realized the extent of the ash across the continent, it became easier to convince the industry that it almost has to come from this area.”

Here, There and … Everywhere?

Totten says he hasn’t been able to look at enough of the Gulf to determine the full impact, but does say, “It isn’t concentrated everywhere. We reported that it seems to occur within higher order channel deposits in amalgamated channels. “That being said,” he continued, “it does seem to occur in at least trace levels in every sample we looked at of the appropriate age.”

And this isn’t just an academic exercise. Totten points to two instances where industry has drilled false positives: One happened in the late 1970s, when Shell explored an area in the Green Canyon, and the other involved a project conducted by Spirit 76 a few years ago. “I met an independent at GCAGS (in September) that had just drilled an ash-filled false positive, but I was not told exactly where,” he said.

Totten believes that once “we get all of this worked out,” industry will have the ability to “determine what sediment pathways are active during the time period of ash deposition.”

As for now, Totten says there isn’t a device that can uniformly and consistently detect the differences between a positive finding of oil reserves and a concentration of ash, which is why finding out where the deposits are beforehand are so important. “After the well is drilled,” he said, “ash is reasonably easy to identify on well logs.”

The ‘Down Under’ Meeting Is Over the Top

The 2006 AAPG International Meeting at the remote venue of Perth, Australia, proved as prolific as the petroleum geology of the region with a record-setting 2,650 registrants, the largest attendance ever for an AAPG international gathering.

The meeting’s opening session attracted a large crowd to the Perth Convention Center, featuring welcoming addresses from AAPG President Lee Billingsley, PESA President David Cliff, meeting General Chairman Agu Kantsler and Alan J. Carpenter, the premier of Western Australia, who delivered an upbeat assessment of his region’s on- and offshore potential. Carpenter also emphasized the significant contribution of petroleum exploration and development to the economy of the region and the country.

Speakers at the opening technical session reviewed the 500-million-year geological history of Gondwana, and some history of exploration in the region. Exploration in Australia began in 1829, with discoveries to date of seven billion barrels of oil and 170 trillion cubic feet of gas, yet significant potential remains. Speakers forecast the eventual rise of Australian LNG production to place it in the top five nations.

The Monday morning plenary session echoed the conference theme, “Reunite Gondwana – Realize the Potential, and attracted a large crowd estimated at over 1,500 attendees.” The Perth meeting topped the previous AAPG international meeting high attendance mark of 2,214 set in 1998 in Rio de Janeiro, Brazil.

AAPG Executive Director Rick Fritz said, “The Perth meeting was one of the highest quality technical sessions AAPG has produced. The technical sessions and venue drove record attendance.”

Perth was the 18th designated “international meeting” for the Association, with the average attendance for those 18 meetings being 1,528. However, the last five meetings have drawn an average of 1,977 registrants, indicating the growing global participation in the Association. A complete Perth report will be included in the January EXPLORER.

Unlock the Potential of Your Reservoir.

Today’s reservoirs are more challenging than ever. To unlock their potential requires absolutely precise data. OMNI Laboratories has established higher standards, more thorough protocols, and meticulous quality control measures to ensure unsurpassed accuracy. Plus, we have assembled the finest scientists in the field to provide superior interpretation and analysis. When precise data is paramount, choose OMNI Laboratories.

At OMNI, We’ve Got the Answers.