Field Experiences and Data Processing Capabilities

The PAST ……

The company founder was a pioneer in his field of expertise. Since the mid-1980s, Gochioco successfully built a multi-faceted coal geophysics program for a major US coal company, Consol Energy Inc., which was then a subsidiary of Conoco Inc. and DuPont. Over a dozen geophysical field projects were conducted on a yearly basis in the 1980s and 1990s when the Near-Surface Geophysics field was still at its infancy stage. Various geophysical technologies were developed to address the coal company's complex upstream and downstream challenges.

Coal geophysics formed an integral part of the Earth Sciences Group (ESG) of Consol Research & Development (the former Conoco Coal Research Division). The ESG provided diverse geotechnical services that included geophysics, ground control, hydrogeology, and geology. Thus, Gochioco had experienced working in a multi-disciplinary environment and learned how to integrate other geotechnical data into his interpretation processes.

A montage of photos shows some of the past geophysical field projects conducted.

Seismic crew poised to acquire data (circa 1999).

Fred Ruev Jr., retired from Consol R&D as a Sr. Research Technician of the ESG after 20 years of outstanding service. He also retired from the US Air Force and is a Vietnam War veteran. Earth Sciences Group professionals relied heavily on Fred to prepare and test their various equipments prior to underground instrumentation and field use. On some occasions, he had to go back and rectify the problems as some professionals struggled. Without Fred's dedication and hardwork, dozens of key surface and underground projects would have failed at the onset. Fred was very reliable, methodical, & dependable. As such, LM Gochioco & Associates (LMG&A) Inc. is pleased to have Fred come out of retirement to manage the firm's field operations.

Fred Ruev occasionally supervised some field projects - an electromagnetic (EM) survey on a dry streambed.

Seismic recording system in 4x4 van (circa 1989).

An EM survey over a stream bank.

An electrical resistivity survey along a stream bank.

Since the 1980s, Gochioco successfully used the Conoco high-frequency Vibroseis as a seismic source in shallow geophysical investigations. Recording truck is located in the background. It took nearly 12 years later before other geophysicists worldwide learned how to use this source type in near-surface geophysics surveys (circa 1987).

The ProMax 2D/3D software package was used to process the high-resolution 2D/3D surface seismic data (Consol R&D, Geophysics Lab - circa 1993).

From the ridge tops of the Appalachia Mountains…

to the bowels of the earth,

the company possesses the extensive field and data processing experience to design the most optimum geophysical program to address your complex exploration, environmental, engineering, mining, coal, coalbed methane, and hydrogeology challenges, including shallow petroleum E&P projects.

The PRESENT & FUTURE ……

<u>The Bottom Line</u>: Same professionals, but equipped with the latest and most advanced hardware and software technology tools available.

Unlike other near-surface geophysical companies, the extensive and diverse “hands-on” training of LMG&A Inc. professionals are unprecedented. A company that specializes in only one or two geophysical technologies will obviously and constantly push surveys that they are only familiar with, even though other techniques can deliver better results cost effectively. Remember, **not all geophysicists are trained equally**. Just like in the

medical profession where there are many kinds of specialists. A patient diagnosed with cancer should consult with oncologists, and not heart surgeons or general practitioners. Would you be willing to risks the financial health of your company or your career when randomly choosing a geophysical service company. Obviously, it is wise to do your homework.

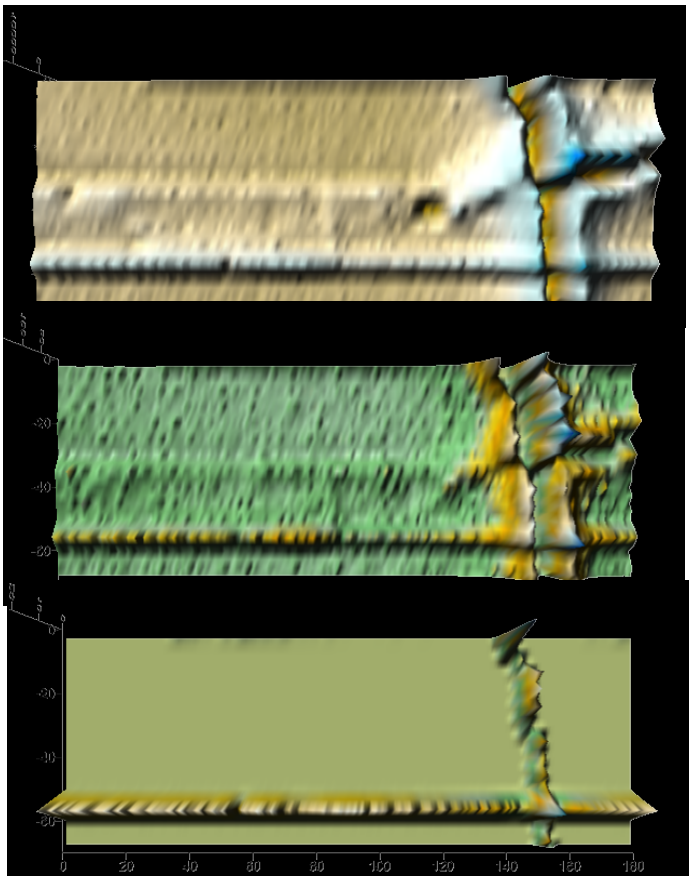
For example, as a result of our unique training and expertise, the company is also working on a private contract to refurbish and rebuild special **Ground Control** instruments for underground instrumentation used to measure roof and floor convergence. Fred is shown below rebuilding and recalibrating the instruments to ensure its reliability and accuracy before installation.

The A-Team is back and providing diverse and expert near-surface geophysics services and consulting to the private and public sectors, including state and federal agencies. The company recently acquired a robust digital multi-frequency source electromagnetic (EM) tool that can be used to address complex environmental, engineering, and mining challenges.

Some recent EM field projects in 2004 and 2005 are shown above and below, whereby the digital EM tool was used to gather valuable near-surface geological and geophysical data to image shallow anomalies.

From the Appalachia Mountains, valleys, streams, and anywhere accessible, LMG&A Inc will design an appropriate geophysical survey to address your needs and challenges.

Some digital EM subsurface profiles are shown below. The study area is known to have pipelines buried over 80 years ago. Different EM profiles clearly show the two intersecting pipelines of different diameters.



High-Resolution 2D/3D Surface Seismic and Underground Inseam Seismic Surveys

The seismic method is the core competence of the company, as the founder has 20+ years in developing and employing the seismic techniques in various forms (high-resolution surface seismic reflection, refraction, cross-well tomography, cross-panel tomography, and underground inseam seismic surveys) to address a variety of challenges.

In July 2002, an underground mining accident occurred at the QueCreek Mine in PA, in which a breakthrough flooded the active mine. The water came from a nearby flooded abandoned mine and trapped nine coal miners for 77 hours before they were all safely rescued. This accident received national attention and raised a serious concern in the industry about poorly-documented old and abandoned mines scattered across the country.

As a result of the founder's unique experience in coal geophysics, the company received a federal government contract in 2005 to conduct geophysical field demonstration projects to detect mine voids. The projects are well under way and on schedule.

The following photos show the seismic crew conducting vertical seismic profiling and high-resolution 2D surface seismic surveys to detect and image old mine works in Ohio (May and July 2005).

Likewise, the company has the necessary hardware and software tools to process in-house nearly all near-surface geophysical data, such as EM, GPR, etc., including the processing of 2D/3D surface seismic data. An HP workstation is shown below.