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**Environmental
NEWS**

Spring 2009

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Emerging stronger than ever



by Timothy Oostdyk, Ph.D., executive vice president and COO

In every corner of the world, there is unprecedented financial turmoil felt by nearly every business segment. All industries today, including the laboratory business, are taking stock of their strengths and weaknesses with the goal of emerging from this recession—for themselves and their customers—stronger than ever.

At Lancaster Laboratories we have a long history of growing our business through both good and bad economic times. Founded in 1961, and with a leadership team that averages more than twenty years with the business, we've seen our share of tough economic times. While every economic recession presents its own unique challenges, we believe the formula for success includes a number of consistent themes, and we have been consistently steadfast in our approach over the years. Specifically, key cornerstones for success are:

Financial stability

Stable workforce

Broad portfolio of customers

Diversified and innovative service offering

Investment in the future

So what does this mean for our customers?

Financial stability—Now more than ever customers need to be concerned with the financial stability of their outsourcing

partners. Lancaster Laboratories is fortunate to be part of one of the strongest companies in the world today, Thermo Fisher Scientific, the world leader in serving science.

Stable workforce—We believe strongly that if you take good care of your employees, they will take good care of your customers, and business success will follow. In good times or bad, we work to take care of our employees, which means the same people serve you year after year.

Broad portfolio of customers—At Lancaster Laboratories we provide scientific services for a diverse group of approximately 2,000 active customers. This means we have a tremendous understanding of the challenges you face and a broad perspective from which to share best practices.

Diversified and innovative service offering—Our service offering is the most innovative and comprehensive available in the laboratory industry today. This means that all your laboratory needs, from a single test, to a major program, to onsite scientific staff, are all available from one trusted source.

Investment in the future—To be an industry leader, investment in the future is critical in both good times and bad. We've just expanded our Lancaster operation with the completion of a new 50,000-square-foot state-of-the-art building addition. We hope you'll set aside some time to visit during our Open House in September.

The bottom line is that our success is directly attributable to doing the right things for our customers at the right time. We understand that the pressures on you to do more with less are greater now than ever. And so our solutions for you are more comprehensive and more flexible than ever before.

Thank you for your business and for the trust you have placed in us. Our business continues to grow because of it, and I want to assure you that we never take it for granted. I wish you and your business all the success in the future, and by working together, may we all emerge stronger than ever.

Open House slated for new building addition

Lancaster Laboratories will host an open house of its new state-of-the-art building addition in September.

The 55,000-square-foot addition will accommodate growth in all scientific service areas as well as house 100 new employees.

We look forward to showing you our expanding capabilities and hearing how we can help you with your outsourcing needs.

Lancaster Labs earns Lilly Global Supplier Award

Lancaster Laboratories has been awarded the 2009 Eli Lilly Global Supplier Award. Lancaster Laboratories was one of a few companies selected among Lilly's 6,500 global suppliers.

Lancaster Laboratories earned the distinguished honor as an elite supplier for having a measurable impact on the company's objectives and priorities. Items of particular interest to be nominated for the Lilly Supplier Award were delivery of exemplary quality, service, speed, total cost reduction and other value adds.

"Since our founding in 1961, a key strength of ours has been our ability to form partnerships and collaborate effectively with our customers for their success and ours," says Dr. Wilson Hershey, Lancaster Laboratories president. "We are delighted our customer service and scientific expertise have served Lilly well."

Instrumentation advances improve metals analyses

Recent advances in instrumentation and accessories are revolutionizing the way trace metals are being analyzed at Lancaster Laboratories. These features allow for lower detection limits in difficult matrices. Samples that would typically be analyzed with high dilutions due to matrix issues are now being analyzed undiluted or with minimal dilutions. Highlights of the innovative new technologies being utilized by Lancaster Laboratories' Metals Department are:

ICP-MS

Significant metals testing advances can be attributed in large part due to the advent of ICP-MS with collision/reaction cell and HMI (High Matrix Interface). The collision cell and HMI serve two unique purposes that work in tandem to achieve superior results in difficult matrices.

The HMI mainly serves the function of allowing higher TDS (Total Dissolved Solids) samples to be analyzed while minimizing matrix effects like signal suppression of the analyte and internal standard signals. The HMI operates by introducing a dilution gas (Argon) in between the spray chamber and plasma torch, effectively diluting the sample aerosol before it enters the plasma. This allows for improved matrix tolerance, significantly reduced drift and a significant reduction in the number of samples requiring dilution due to matrix induced suppression.

The collision/reaction cell primarily serves the function of preventing polyatomic ions from reaching the detector either through a collision or reaction mechanism. These polyatomic ions are primarily responsible for false positive results on a non-collision cell ICP-MS.

Use of the collision cell and HMI equates to lower reporting limits for clients due to the fact that most

samples can be run without dilution and subsequent elevated reporting limits.

Lancaster Laboratories supports the analysis of water, soil and tissue by a variety of EPA methods.

ICP-OES

Lancaster Laboratories currently has five ICPs, including three new Thermo 6500 Series ICPs. All five systems are set up with high solids nebulizers that allow samples with high TDS to be analyzed. These nebulizers greatly reduce the amount of downtime due to high salts clogging the standard nebulizers. The Metals Team is also incorporating FAST autosampler technology, which both reduces total analysis time and significantly lowers the amount of sample introduced into the instrument, also reducing instrument drift and allowing for less frequent maintenance intervals. Both equate to an improved ability to complete client samples with less repeat analysis and greater speed.

Lancaster Laboratories supports the analysis of water, soil and tissue by a variety of EPA methods.

Low Level Mercury

Lancaster Laboratories currently operates a Leeman Labs Hydra AF Gold+ Automated Mercury Analysis System for low level mercury analysis. This system utilizes gold traps for the preconcentration of mercury prior to release to the Atomic Fluorescence detector, allowing for detection limits in the parts per quadrillion range for mercury. The Metals Team utilizes a custom enclosure with hepa-filtered air

and keeps the enclosure under positive pressure to avoid potential mercury contamination from external sources such as particulate in the air. Lancaster Laboratories offers this capability in support of EPA Method 1631E.



David Beck, chemist in the Metals Department, performs routine maintenance on the Agilent 7500ce. The instrument is equipped with an argon humidifier, which supplements the HMI and collision cell to allow for analysis of high matrix samples.

Mercury Cold Vapor Atomic Absorption

Lancaster Laboratories also supports the analysis of mercury in soil, water and tissue samples by EPA Method 245.1, 7470A and 7471A. Although detection limits are not as low as those offered by EPA Method 1631E, Mercury by CVAA offers detection limits in the sub-parts per billion range. All of this can be accomplished in about one minute per sample on the instrument. This instrument allows customers to meet low regulatory limits at an economical price.

Air testing flows smoothly with advance planning

Volatile chemicals from contaminated groundwater or buried wastes can emit vapors that may migrate through soil and into the air of buildings situated above. Although the concentrations of the contaminants are typically low, there are extreme cases where vapors may accumulate in buildings to levels that pose health hazards. Known as vapor intrusion, this problem has prompted USEPA and many states to develop guidance documents for assessing indoor air quality. Planning and communication with the laboratory are key to the success of any indoor air or soil vapor monitoring projects. Sample size and interval, choice of test method, quality control sample collection, parameter list and reporting format are among the variables to consider so that the test results generated will meet regulatory needs.

summa canisters are reusable, they must be cleaned after each use. To ensure that no trace of the previous sample remains, Lancaster Laboratories certifies that their canisters are clean down to the method detection limit of the analysis. After cleaning, the canister is evacuated and sent into the field with appropriate sample collection equipment, including vacuum gauges to monitor the sampling process and flow controllers fitted with filters to prevent interference from particulates. Each flow controller is individually set based on the sampling event parameters, such as the volume of the canister, the sampling time interval and the location of the sampling equipment. Consistent vacuum throughout the sampling event is achieved by setting the flow control valve to collect about five liters of sample in a six liter canister. Pressure checks are performed

the reproducibility of the sampling process. Some sampling plans also incorporate the use of a tracer gas to demonstrate that the sampling system is free of leaks at the probe level. Selection of a tracer gas is based on the sampling situation and the compounds of concern. The tracer gas must not interfere in the chromatography of the target compounds, but it must also be readily detected using the chosen analytical method. Therefore, discussion of the tracer gas with the laboratory is critical. All QC samples are processed using the same procedures and analytical methods as the field samples.

The analytical method should be chosen prior to sampling to ensure that all of the project requirements can be met by the laboratory. Lancaster Laboratories offers a number of methods appropriate for air analysis and has specialized equipment to meet the low limits often specified for indoor air analysis. Most of these tests employ a GC/MS, and Lancaster Laboratories has instruments that are capable of operation in the selected ion mode (SIM), which provides even greater sensitivity and the lowest detection limits. Typical method detection limits for TO-15 are in the range of 0.2 ppbv. The reporting units needed are also part of the information to be communicated to the laboratory since the conversion factors for air testing are more complex than for other matrices. Lancaster Laboratories has years of experience analyzing air samples and holds certifications for air analysis in eight states.

on canisters returned to Lancaster Laboratories to confirm a detectable vacuum, indicating a valid sample.

The list of compounds of concern for possible soil vapor intrusion, usually identified through earlier remediation assessments, must be communicated to the laboratory, along with the required analytical method and detection limits. Volatile organic compounds are typically determined by USEPA Method TO-15. In order to generate defensible

data, quality control samples are needed to prove that the sampling process was not compromised in any way. Lancaster Laboratories supplies appropriately prepared canisters for use as field blanks and trip blanks to detect sources of sample contamination. Lancaster Laboratories also provides the hardware necessary to collect field duplicates, which may be required to demonstrate

With air analysis comes many details to be worked out between the client, the sampling team and the laboratory. Advance planning and communication are key to successful, efficient completion of each project. Lancaster Laboratories has knowledgeable client service representatives who are trained to assist clients with questions on sampling equipment, method selection and reporting requirements. For more information on air analysis, call Environmental Client Services at 717-656-2300.



Jon Nardelli, senior chemist in the Volatiles in Air Department, utilizes the Summa canister system Lancaster Laboratories recently added, which decreases the time necessary to clean, certify and ship a Summa canister.

The preferred sampling technique for whole air samples employs a summa canister, which is a specially cleaned and passivated metal container. The canisters are available in various sizes, and Lancaster Laboratories maintains a large stock of the one and six liter sizes. Ambient or indoor air sampling usually requires a six liter canister to meet the stringent sampling limits. Because

The importance of GC/MS analysis of Alkylated Polycyclic Aromatic Hydrocarbons

Polycyclic Aromatic Hydrocarbons (PAHs) is a class of compounds that has appeared on priority pollutant lists since the early days of site remediation because they can pose a risk to human health and are very slow to degrade. More recently, there has also been interest in detecting alkylated PAHs, which contain an alkyl chain bonded to the carbon in an aromatic ring. For each parent PAH, there is a homologous series of alkylated PAHs with an increasing number of attached carbon molecules. PAHs and their homologs can originate from petrogenic sources, meaning they occur naturally in petroleum compounds, or pyrogenic sources, which are created upon combustion. In areas impacted by oil spills, these compounds are of concern for aquatic life, especially sediment dwelling biota. Both USEPA and the National Oceanic and Atmospheric Administration (NOAA) have conducted studies on the concentrations and effects of these compounds in marine sediments.

In addition to the basic health concerns about the bioavailability of these compounds to organisms, data on these compounds can have a forensic application. Alkylated PAHs are more abundant than their parent PAH compounds in oil, so information about the relative concentrations of these two species can provide a clue to their source. For example, contamination from a specific spill can be differentiated from background pyrogenic sources.

Analysis for PAHs can be accomplished using USEPA method 8270, which uses a GC/

MS to identify and quantitate the target compounds. A reference standard is used for each PAH compound to be reported. The applicability of method 8270 to homologs of PAHs is limited by the lack of reference standards. However, Lancaster Laboratories has been successful in adapting this method to provide semi-quantitative data for the alkylated PAHs. The GC/MS provides a mass spectroscopic "fingerprint" of the parent

PAH that can also be used to identify PAH homologs, and the instrument response factor from the parent PAH can then be used to estimate the concentration of PAH homologs. This method can be applied to extracts from aquatic sediment, tissue, water and soil samples.

For more information about alkylated PAH analysis, call Environmental Client Services at 717-656-2300.

NJDEP publishes low level air testing method

NJDEP has published a modification of USEPA Method TO-15 for the analysis of volatile organic compounds (VOC) in air samples using GC/MS. The new method, which is identified as NJDEP-LLTO-15-3/2007, may be found on the NJDEP website under their site remediation program. Lower reporting limits and additional quality control requirements are among the modifications to the original method.

The reporting limits published using the modified method are 2.5 times lower than the limits attained when using the unmodified USEPA method. The dynamic range of the method is increased by analyzing a standard curve that uses lower concentration standards at the bottom end and higher concentrations at the top end. However, increasing the range of the standards also makes it more difficult to meet calibration quality control requirements. The amended quality control sample criteria also

present challenges. For example, the method includes a requirement to analyze a laboratory control sample at the limit of quantitation and recover a concentration that is within 30 percent of the true value.

Although some clarifications to the NJDEP document are still anticipated, Lancaster Laboratories is in the process of performing method validation work to demonstrate their capability to perform the method and plans to submit the data to the agency in an effort to add the low level method to their existing NJDEP certification. Lancaster Laboratories is one of only a handful of laboratories planning to pursue the certification. "We expect to submit our data package for certification once the clarifications are posted by NJDEP," says Duane Luckenbill, director of Environmental Sciences. The ability to produce a compliant analytical data package that can be validated by NJDEP is part of the initial certification requirement for LLTO-15.

Supporting Pharmaceutical Operations with EPA test methods

As one of the largest contract laboratories in the country, Lancaster Laboratories provides comprehensive analytical services in the environmental, pharmaceutical and biopharmaceutical sciences. While the clients for the two latter categories are almost exclusively Pharmaceutical and related firms, the testing performed in the Environmental Sciences departments supports a wide variety of industries, from local municipalities to world wide petrochemicals companies. Not surprisingly, there is some crossover between the client lists for the three divisions.

Pharmaceutical clients typically require testing to meet USFDA requirements, but there are some applications for USEPA methods to support their development and manufacturing operations.

Monitoring of plant effluent for contaminants specifically related to pharmaceutical manufacturing operations is one example where Lancaster Laboratories' Environmental Sciences departments can help pharmaceutical clients meet government regulations.

The Pharmaceutical Effluent Guidelines (PEG), found in 40 CFR Part 439 include nontraditional analytes and analytical methods specific to the industry. The monitoring requirements are based on the type of operations at the facility, and Lancaster Laboratories is capable of testing for all of the contaminants listed in the regulation. The contaminant list and more information about the regulations are available at www.lancasterlabs.com/environmental/9043_02.pdf.

Verifying the purity of plant influent and drinking water used for toxicology testing is another niche

that Lancaster Laboratories can fill for pharmaceutical clients. USFDA Good Laboratory Practice (GLP) regulations require that water supplied to animals used in testing within the scope of GLPs must be analyzed periodically to ensure that contaminants known to be capable of interfering with the study are not present in significant levels.

Since Lancaster Laboratories is certified to perform drinking water analysis, firms with animal facilities

Quality Assurance Unit has procedures in place to provide the extra oversight required in the GLP regulations. Because projects requiring strict GLP compliance involve more up front planning than typical projects, communication with the laboratory about the project requirements is paramount to a successful outcome.

For more information, contact Barb Weyandt at 717-656-2300, Ext. 1576.



Environmental chemist Lindsey Lafferty analyzes water samples for contaminants.

can request testing in support of GLP projects with the assurance that they are using a firm with experience and expertise in the test methods.

In addition, the standard operating procedures for documentation, instruments and personnel used in the Environmental Sciences laboratories include the requirements of the GLP regulations, and if strict GLP compliance is requested, Lancaster Laboratories'

Contact us

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At Lancaster Laboratories, we believe that our people provide our strength. Their dedication to quality, professional competence and hard work is the key element in the company's success. In this regular feature, we introduce you to some of the people who have helped make Lancaster Labs an industry leader.

On February 6, data packages director Michele Turner tragically made international headlines when she was lost at sea for seven hours during a diving trip on the Great Barrier Reef. Michele was swept away from her dive boat by surreal currents while under water, discovering the dire circumstances upon surfacing. As one of Lancaster Labs' senior leaders for 22 years, Michele has led her teams by example of hard work, determination, strategic goal planning, and an art for analytical problem-solving. These traits probably helped save her life along with her pink fins, which she innovatively used to flag down a rescue helicopter. And Michele notes she remained pretty cool throughout the ordeal, which is primarily how she approaches her daily challenges at Lancaster Labs.

What is the scope of your department?

I am lucky to have teams that cover much of a sample's life here at the lab. At the front end, I have the Sample Support Department where samples are stored and a variety of other front-end tasks occur. Metals and our two Inorganic Water Quality teams analyze samples by the required methods. And after all the results are reported, our Data Deliverables Team generates the electronic data deliverable or data package to meet client specifications.

How would you characterize your leadership style?

I collaborate in a positive

People are the Chemistry



manner to achieve results and win-win outcomes while providing support and encouragement as well as remaining calm under pressure. Then I basically try to get out the way so everyone can get their work done! I'm here if they need me and am willing to pitch in to help however I can.

You've been here for 22 years and seen countless changes. Is there anything that hasn't changed during your tenure?

The commitment to quality and ethics at all levels in the organization. They were founding principles and continue to be strong. I am proud that maintaining quality is always at the forefront of our process improvement efforts.

And when you're not working?

I live in Lititz, PA, with my husband, Harry, and have two adult step-children. And recently, our first grandchild, Josiah Douglas, was born! He's a cutie. I'm a very happy step-grandma! And we love to travel and take turns picking vacations. On land, I'd have to say Egypt is the most memorable so far. I love to scuba dive and usually get to go on a trip each year with friends. Also, I have been actively involved with the Wheatland-Conestoga Chapter of the American Business Women's Association for several years.

Lunch and Learn with Lancaster Labs

Lancaster Labs' offers technical seminars on regulatory topics and supporting testing capabilities along with lunch on us. Topics include:

Vapor and Air Analyses: project planning, regulations and sampling protocol for soil gas, vapor intrusion or other air related projects.

Petroleum Analyses: methods, results interpretation and common interferences.

Detection Limits and Low Level Analyses: Understanding MDLs, LOQs and PQLs; interpreting analysis reports and determining when low level analysis techniques are needed.

Low Level Metals Analysis Using ICP/MS Reaction/Collision Cell with HMI to Eliminate Interferences.

Specialty Analyses and Method Development: Explosives, Perchlorate, Hydrazines, Alkyl PAHS.

Laboratory Testing QC/QA: detailed explanation laboratory QC sample value and data evaluation.

Call environmental business development to schedule a presentation at your site. 717-656-2300.

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Newsmakers

Charles Neslund, manager, Environmental Services, and **Dr. Jia Wang**, principal chemist, Environmental Services, presented two poster sessions at the **Environmental Monitoring & Data Quality Workshop** titled:

Analysis of Selected Perfluorinated Alkyl Acids in Drinking Water by LC/MS/MS, EPA Method 537, a Validation Study

A Sensitive and Selective Method for the Analysis of Hydrazines in Water and Soil

**Please visit lancasterlabs.com to view the aforementioned presentations.*

Visit us at...

NELAC & NEMC National Environmental Monitoring Conf.	August 10-14	San Antonio, TX
NGWA - 7th International Conf. on Pharmaceuticals & Endocrine Disrupting Chemicals in Water	Sept. 22-23	Baltimore, MD
AEHS Soils Conference	October 19-22	Amherst, MA
Railroad Environmental Conf.	October 27-29	Champaign, IL
NGWA - Petroleum, Organics in Water	November 2-3	Costa Mesa, CA

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