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Mission element added to National Laboratory

Several months ago, Tim Miller, Chief, USGS Office of Water Quality, was approached by the Chief, Office of Groundwater, about the idea of having the NWQL assume responsibility for the analytical portion of what is now called the Department of Defense Earth Science Program (DODESP), formerly known as the DOD Environmental Conservation (DODEC) program.

This analytical support program brings commercial laboratory support to USGS projects that typically require monitoring for regulatory compliance or legal consent decrees and National Pollutant Discharge Elimination System permits. The current contract is with Severn-Trent Laboratories (STL). The program also maintains a small data-validation contract to help with data review.

The mission and the current project chief, Richard Daddow, were re-assigned to the NWQL in June. For the

first year, Daddow and the DODESP will be managed by Merle Shockey, supervisory chemist, in an effort to harmonize the program's operation with that of the NWQL. The NWQL administrative staff has provided support for Daddow for several years and is already familiar with these aspects of the program. Daddow is relocating from building 53 to building 95 and is expected to complete the move by mid-July.

I see this new mission element making us stronger in that it broadens our ability to bring a host of potential solutions to meet customer needs. I believe this is a good decision for both the NWQL and the DODESP, and I welcome the opportunity to work even more closely with Richard to bring the best analytical support possible to bear on USGS science needs.

Thanks, GBM

Greg Mohrman
Chief, National Water Quality Laboratory
June 6, 2006

TIM PETTY VISITS

LAB—Jeff Stewart (left), physical science technician, Sample Preparation Unit, briefs Tim Petty, the new Deputy Assistant Secretary for Water and Science in the U.S. Department of the Interior, during a tour of the NWQL June 1. Partially hidden behind Petty is Hardy Pearce, USGS Liaison to the Office of the Assistant Secretary for Water and Science, and Christian Dennis (seated), laboratory technician.



Contracting Officer's Representative: Duties and data review

Richard Daddow is the U.S. Geological Survey (USGS) contracting officer's representative for the USGS contract with Severn-Trent Laboratories. The contract is performance based and requires that Severn-Trent provide full-service analytical services, supplies, and a wide variety of data deliverables for chemical and geotechnical analyses of environmental samples collected for the USGS Department of Defense Earth Science Program and other projects.

The Severn-Trent Laboratories network consists of about 30 separate laboratory facilities throughout the United States. The majority of the USGS sample analyses is completed at the Severn-Trent Denver Laboratory, but other STL laboratories are used for USGS sample analyses.

Daddow conducts technical and contract-compliance reviews of laboratory data deliverables from Severn-Trent to determine if the USGS con-

tract and project-specific requirements have been completed properly and within the specified time. The technical review by Daddow includes checking analytical request/chain-of-custody forms, sample analyses and associated laboratory quality-control data, and selected laboratory results for unprocessed data. The work is documented on a contract laboratory data-review worksheet for each laboratory sample delivery group.

Risch to head DODESP

Martin Risch has been named as Water Program Manager for the Department of Defense Earth Science Program (DODESP). The appointment is a part-time collateral duty in the Indiana Water Science Center, where Risch serves as hydrologist and project chief.

Risch will help coordinate and communicate among the Water Science Centers that are developing earth science projects with U.S. Department of Defense agencies. Richard Daddow will continue to manage the Severn-Trent Laboratory contract and provide initial quality assurance of water-quality data in support of DODESP and other USGS projects.

As of fiscal year 2005, there were 50 DODESP projects in 17 USGS Water Science Centers, funded by the Air Force, Army, Marines, Navy, and National Guard.



INSTRUMENT UPGRADE—The Gas Chromatography/Mass Spectrometry Unit has acquired two new gas chromatograph/mass selective detectors for determining emerging contaminants. Duane Wydoski, unit supervisor, expects increased efficiency and quality of data production. For example, the mass range will be increased from 750 to 1,050 atomic mass units; and scan rates will jump 30 percent, from 7,000 to 10,000 scans per second. Following validation, Wydoski expects improved method detection limits in the parts-per-trillion range (nanograms per liter for water samples and nanograms per kilogram for sediment samples). Actual detection limits are contaminant and method specific, and may be higher or lower for specific contaminants. In addition, the new instruments can be operated in the negative chemical ionization mode, which is expected to reduce instrumental analysis time for selected halogenated compounds. Steven Smith, chemist, U.S. Geological Survey National Water Quality Laboratory, is shown injecting a water sample for analysis.

Lab receives Gold Award from Metro Wastewater

Greg Mohrman, NWQL chief, was presented with a recognition award “For 100 Percent Compliance with Industrial Pretreatment Requirements and a Dedicated Commitment to Environmental Excellence,” April 25.

The 2005 Gold Award was presented by the Metro Wastewater Reclamation District at a breakfast awards ceremony in Denver. Mohrman called it a building 95 award because “100-percent compliance has taken the dedicated efforts of all NWQL employees plus those of the Branch of Quality Systems and the National Research Program.”

Mohrman especially thanked the Safety, Health, and Environmental Compliance Office for making sure that the Laboratory remains a leader in environmental stewardship. And he thanked the AET Environmental staff for ensuring our treatment processes for chemical management and disposal are optimized to achieve the discharge standards.



METRO WASTEWATER AWARD—The NWQL received the 2005 Gold Award from the Metro Wastewater Reclamation District at a breakfast ceremony April 25. Helen Wharry, chemist in the Safety, Health, and Environmental Compliance Office, received the award on behalf of the NWQL. Greg Mohrman (left), NWQL chief, and Anthony G. Ferraro, chairman of the board of directors, Metro Wastewater Reclamation District, took part in the ceremony.



BIRD IN THE HAND—Joe Santillanes, material identifier and examiner, Safety, Health, and Environmental Compliance Office, examines a lost parakeet that was rescued outside building 95. The bird appeared to be in good health. It was adopted by Mary Cast, who says her 10-year-old son Charles is “thrilled with his new pet” and named him “Lucky.”

New publications

(NWQL authors in **boldface**)

REPORTS

Burkhardt, M.R., Zaugg, S.D., Smith, S.G., and ReVello, R.C., 2006, Determination of wastewater compounds in sediment and soil by pressurized solvent extraction, solid-phase extraction, and capillary-column gas chromatography/mass spectrometry: U.S. Geological Survey Techniques and Methods, book 5, chap. B2, 33 p.

Schnoebelen, Douglas, Kolpin, Dana, Barber, Larry, **Furlong, Edward**, Meyer, Michael, and Skopec, Mary, 2006, Chemicals of concern—Iowa’s first field research area for emerging contaminants: Mount Vernon, Iowa, The Iowa Policy Project, available online at URL <http://www.iowapolicyproject.org/>

Zaugg, S.D., Burkhardt, M.R., Burbank, T.L., Olson, M.C., Iverson, J.L., and Schroeder, M.P., 2006, Determination of semivolatile organic compounds and polycyclic aromatic hydrocarbons in solids by gas chromatography/mass spectrometry: U.S. Geological Survey Techniques and Methods, book 5, chap. B3, 44 p. Available online at URL <http://pubs.water.usgs.gov/tm5b3/>

News briefs

The Metals Unit last month acquired another inductively coupled plasma–mass spectrometer (ICP–MS) for use in providing collision/reaction cell technology to aid in determining elements that have polyatomic interferences. This new instrument supplements three other ICP–MS instruments with autosamplers in a class 100 laminar flow hood for reducing contamination. For details, see the Newsletter archive, at URL <http://nwql.usgs.gov/Public/news/waterlogs10-04.pdf>, page 3.

* * *

The NWQL Safety, Health, and Environmental Compliance Office reminds analysts and technicians that all samples should be treated as potentially hazardous. Employees should always use personal protective equipment as designated in the method Standard Operating Procedure when handling samples. Although the NWQL does receive information regarding highly contaminated samples, this is not always the case. The samplers do not always know the contamination levels of the samples they are collecting.

Quality Assurance adds compliance specialist

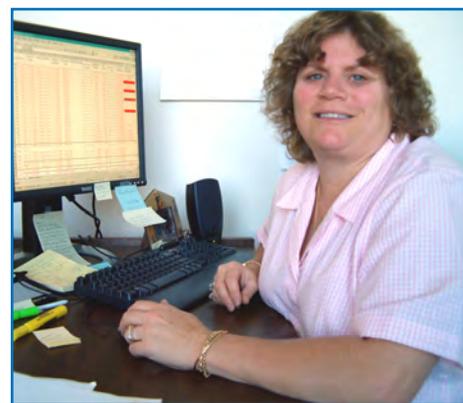
Tom Maloney, chief of Quality Assurance (QA), has announced the selection of Lisa Bressler to fill a position vacancy in the Quality Assurance Section. Lisa's first day was May 15. Maloney said she will be responsible for preparing and updating the Quality Management System Document. She will coordinate compliance activities associated with the National Environmental Laboratory Accreditation Conference (NELAC) internal audit project required for analytical laboratories.

Lisa comes to the NWQL from the Department of Energy Rocky Flats Nuclear Plant where she served in several capacities.

After graduating in 1983 from the University of South Carolina with a Bachelor of Science degree in mechan-

ical engineering, she went to work for the Department of Defense at the Charleston Naval Shipyard in Charleston, S.C. Her job included material procurement and quality assurance and procedure writing in the overhaul of nuclear powered submarines. Lisa's next career move was in 1987 with the Tennessee Valley Authority, Sequoyah Nuclear Power (SQN) Plant in Chattanooga, Tenn. She procured materials, verified material quality inspection and certification, and their installation.

In 1992, she was hired by the Department of Energy to work at the Rocky Flats Nuclear Plant. Duties included being a project/construction manager for new construction and the modification of existing facilities. Afterwards, she became the Price Anderson Amendments Act Coordinator, which involved the review, verifi-



Lisa Bressler

cation, and compliance with nuclear Rules and Regulations set forth by Congress, encompassing compliance with a Radiation Protection Rule and a Quality Assurance Rule. With the closing of Rocky Flats, Lisa stayed on as the Freedom of Information Act/Privacy Act Officer.

Bizu joins Administrative Services



Daniel Bizu

Daniel Bizu joined Administrative Services May 15, filling the vacant position of laboratory records technician. Patricia Johnson, administrative officer, said Bizu brings "a substantial administrative background with emphasis on computer applications."

Bizu spent the last 8 years in the lighting business. He also served in the U.S. Marine Corps and was stationed in Japan.

Summer sample shipping schedule

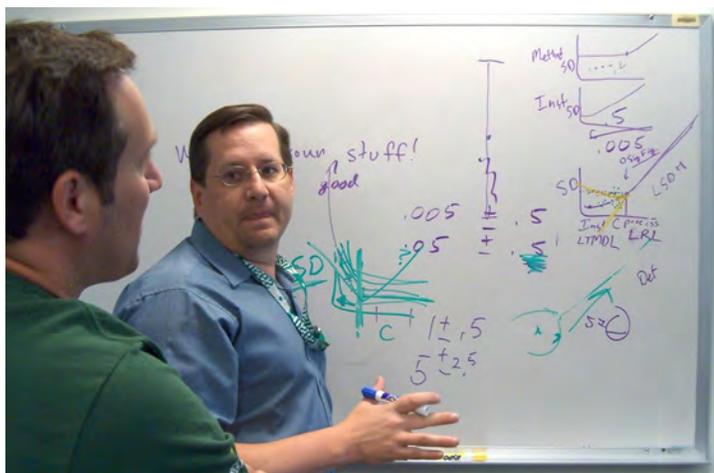
The NWQL will be closed for the Independence Day holiday on Tuesday, July 4. There will be a sample pickup on Monday, July 3. Normal business will resume on Wednesday, July 5.

The NWQL also will be closed on September 4 in observance of Labor Day. There will be a sample pickup on Saturday, September 2, for those customers who ship overnight samples on Friday, September 1. Normal business will resume on Tuesday, September 5.

Customers are reminded that the fiscal year close-out date for receipt of samples is September 8. Samples shipped on Friday, September 8, will be picked up and logged in on Saturday, September 9. Be sure to mark your FedEx air bill "priority overnight" and Saturday delivery.

STRATEGY SESSION—

Chemists Steven Smith (left) and Mark Burkhardt troubleshoot analytical issues on the wallboard.



Frequently asked questions

New analytical method expands the capability of determining a broad range of wastewater indicator compounds in environmental sediment and soil samples

What does the new method offer?

The method was developed to identify the concentrations of certain chemicals in wastewater and wastewater-affected sediment and soil. A subset of the compounds determined by this method has been shown to modulate endocrine activity in aquatic organisms (U.S. Environmental Protection Agency, 1997; Hentz and Lamb, 2005). The method also may be used to evaluate the effects of combined sanitary and storm-sewer overflows on the sediment quality of urban streams.

The method identifies and quantifies individual compounds using retention times and spectral matches, in addition to standard calibration curves.

A diverse series of compounds was selected that focuses on wastewater indicators and their toxicity or potential to modulate or disrupt endocrine activity. The analyte list contains 61 individual compounds, including alkylphenol ethoxylate nonionic surfactants and their degradates, food additives, fragrances, antioxidants, flame retardants, plasticizers, industrial solvents, disinfectants, fecal sterols, polycyclic aromatic hydrocarbons, and high-use domestic pesticides.

The new method complements, but does not precisely match, existing NWQL laboratory schedule 1433, wastewater indicators in water. This considerably expands the analytical capability of wastewater indicator compounds by adding sediment and soil matrices.

What are the features of the new method?

Using solid-phase extraction, the new method is rapid, efficient, and was developed potentially to replace Soxhlet sample-preparation techniques used at the NWQL. There are advantages to using this method over earlier sediment methods. The pressurized solvent extraction, coupled with the solid-phase based clean-up step, provides a low matrix-background extract that reduces chemical

noise, resulting in low detection limits and use of full-scan monitoring. The method also allows different compound classes to be monitored simultaneously for use as a screening method in water-quality studies with several compound classes being determined from the same extract.

Initially, 20 compounds will be reported as estimated concentrations because of recovery, precision, blank contamination, or reference standard issues. Interim method detection limits for the 61 individual compounds range from about 12 to 850 micrograms per kilogram ($\mu\text{g}/\text{kg}$).

How are data reported?

If the concentration is equal to or greater than the minimum reporting level (MRL), the concentration is reported to three significant figures. If the concentration is less than either the MRL or the lowest calibration standard, results are reported by using the "E" code to indicate that it has been estimated. If the result is greater than the highest concentration standard in the calibration curve, the sample is diluted into the range of the calibration curve and reanalyzed.

Concentrations for field samples are reported in micrograms per kilogram dry sediment using three significant figures; surrogate data and set spikes are reported as percent recovery.

What is the new method number, and laboratory and parameter codes?

The U.S. Geological Survey (USGS) method number is O-5433-06 (NWQL schedule number 5433) for sediment and soil.

A list of the analytes, laboratory and parameter codes, reporting limits, units, and sampling containers used for samples is available on the NWQL USGS-visible web site at <http://nwql.cr.usgs.gov/usgs/catalog/index.cfm>.

Click on LIMS Catalog (upper right corner). Choose a search category, schedule number in this instance, and enter schedule number 5433 to access detailed information about wastewater indicator compounds in sediment and soil.

What procedures are required for shipping samples to the NWQL? At least 100 grams of sample should be collected,

placed into a clear glass bottle (bottle type BGC) (No. Q410FLD in One Stop Shopping catalog at URL <http://1stop.usgs.gov/>), chilled, and maintained at 4°C using the protocols outlined in the USGS national field manual for the collection of water-quality data (U.S. Geological Survey, variously dated). Sample sizes with less material will have elevated reporting levels.

Ship samples by overnight carrier to the NWQL as soon as possible after collection. Sediment and soil samples must be shipped on ice.

May any Water Science Center use the new methods?

Yes. The Office of Water Quality approved the new water-quality analytical method for the determination of wastewater indicator compounds in sediment and soil on 28 February 2006.

How do I obtain a copy of the new method?

A copy of the report by Burkhardt and others (2006) may be downloaded from the NWQL USGS-visible web site (<http://www.nwql.cr.usgs.gov/USGS/pubs-only.html>), requested by E-mail to the NWQL Technical Editor (jwraese@usgs.gov) or LabHelp@usgs.gov, or calling 1-866-ASK-NWQL.

References

- Burkhardt, M.R., Zaugg, S.D., Smith, S.G., and ReVello, R.C., 2006, Determination of wastewater compounds in sediment and soil by pressurized solvent extraction, solid-phase extraction, and capillary-column gas chromatography/mass spectrometry: U.S. Geological Survey Techniques and Methods, book 5, chap. B2, vi + 33 p.
- Hentz, K.L., and Lamb IV, J.C., 2005, State of the science and policy for endocrine disruption, 2005 update: Washington, D.C., The Weinberg Group Inc., 11 p., accessed June 29, 2006, at URL http://www.americanchemistry.com/s_acc/bin.asp?CID=441&DID=1517&DOC=FILE.PDF

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U.S. Geological Survey National Water Quality Laboratory

Summary

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NWQL USGS-visible web site:
<http://www.nwql.cr.usgs.gov/USGS>

The U.S. Geological Survey (USGS) National Water Quality Laboratory (NWQL) offers environmental analytical services, including inorganic, organic, and radiochemical constituents, and provides high-quality, reproducible data. The laboratory specializes in trace- and ultratrace-level analyses of water, sediment, and tissue, as well as identification and quantitation of benthic invertebrates. The NWQL also provides specialized services to its customers, including project planning, method development, customized projects, and data management.

Areas of Expertise

- scientifically and legally defensible data
- inorganic, organic, and radiochemistry
- trace and ultratrace-level detection
- advanced environmental analytical methodologies
- different matrices (water, sediment, tissue)
- identification and quantitation of benthic invertebrates
- methods research and development
- quality-assured supplies for field sampling

Personnel

- diverse staff of about 160 scientists and technicians that includes both Federal and contract employees
- expertise includes chemistry, environmental biology, hydrology, geology, and business administration

Facilities

- state-of-the-art facility (completed in 1999)
- secure facility with isolation for chain-of-custody samples
- high-production capability
- high-efficiency-particle-arresting (HEPA) filtered air to remove air-borne contaminants
- source water meets the ASTM International standards for purity; nanopure water used where required

Laboratory Information Management System (LIMS)

- customized LIMS manages workflow through the laboratory from receipt of samples through data release to customers and archival
- LIMS allows
 - scheduling tests to be performed on a sample
 - storing and retrieving analytical results
 - performing data review with manual oversight
 - performing data production QA and QC
 - creating work lists for analytical lines to ensure sample processing within appropriate holding time(s)
 - tracking bottles received
 - interfacing of automated laboratory procedures
 - online accessibility of historical data, 1992 to present

Customer Service

- online laboratory services catalog searchable by analyte, schedule, and laboratory and parameter codes

- 1-866-ASK-NWQL or by email at LabHelp@usgs.gov
- email LabLogin@usgs.gov for receipt-of-sample issues
- online sample status and tracking

Commitment to Safety, Health, & Environmental Compliance

- emergency response to spills, injuries, and other medical emergencies
- frequent internal safety assessments, inspections, and audits to ensure a safe working environment
- medical surveillance program for laboratory personnel
- compliance with State of Colorado Resource Conservation & Recovery Act and Metropolitan Wastewater Reclamation District discharge permit
- LIMS tracking of sample disposal and any hazardous materials that may be in samples
- continuing effort to improve and minimize waste streams

Accreditations & Certificates

- National Environmental Laboratory Accreditation Program (NELAP)
- State of New York nonpotable constituents

External Validation

Performance evaluations

- Environment Canada Federal Provincial Studies
- NELAP
- New York State Department of Health
- USGS Branch of Quality Systems
- Chesapeake Bay Blind Audit

Audits

- NELAP
- New York State Department of Health
- USGS Radiological Safety Committee

Representation on Scientific Committees

- ASTM International
- National Environmental Methods Index
- Multi-Agency Radiological Laboratory Analytical Protocols
- Methods and Data Comparability Board
- Environment Canada Federal Provincial Advisory Board

U.S. Environmental Protection Agency, 1997, Fact sheet: EPA special report on endocrine disruption, accessed June 29, 2006, at URL http://c3.org/chlorine_issues/health/epaenddisr.html

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• MARK BURKHARDT, STEVEN ZAUGG, STEVEN SMITH, RHIANNON REVELLO, and ALLISON BRIGHAM



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REMEDIATION WORK—Remediation work was underway west of the National Water Quality Laboratory (building 95) when this photograph was taken March 15. Plans call for a hospital and a mass transit station to be built on the site at the Denver Federal Center.



USGS AND RIDE THE ROCKIES—The U.S. Geological Survey left no stone unturned in the 21st edition of Ride The Rockies this year. Tom Casadevall (seated), regional director, Central Region, described the geology of the route in detail during one of the cycling seminars. He is joined at the USGS information tent by Susan Rhea, Geology Hazards Team, Golden, Colo., and Janet Slate, Geology, Denver, at Fort Lewis College, in Durango, Colo., the host for the tour's second stop.

