



Volume 2

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## Eliminating some 'bottlenecks' in Log-in

The National Water Quality Laboratory (NWQL) Log-in Unit is improving District liaison and customer feedback. Beginning February 1, Districts are telephoned whenever samples are unpacked and a problem is identified. The Log-in Unit also has upgraded feedback by providing a monthly report of problems (by State). This campaign is designed to improve the NWQL's service by cutting down on bottle mix-up and log-in error, and by reducing sample-handling problems in the Districts.

Problems that result in a telephone call are as follows: invalid laboratory codes, schedules, and unique numbers; time, date, or station identification on the Analytical Services Request (ASR) form does not match the bottles; incorrect bottle types shipped for requested analysis; bottles sent but analysis not requested on the ASR form; no ASR form received for samples; bottles broken in transit; and improper cooler packing.

In most cases, problems are easily fixed and samples are logged in to meet all holding times (as defined in USGS Open-File Report 92-495, p. 15), including the following: incorrect laboratory codes, schedules, and invalid unique numbers; the ASR form and bottles do not match station identification, date or time; a sample bottle is broken in transit; and coolers are improperly packed. In such cases, telephone calls are made to clarify the situation rather than for Log-in to attempt, on its own, to solve the problem. And, hopefully, the next shipment will be trouble free.

Sometimes, the samples cannot be logged in until the collector is contacted because organic sample bottles are broken, no ASR forms are received, or extra bottles are received without any analyses requested. Holding times may not be met if the NWQL cannot reach the collector or project chief. These cases indicate the need for a current telephone number, collector, and project chief to be written on each ASR form.

The monthly report is sent by the fifteenth of each month and reflects the number and type of problems received in Log-in during the previous month. Project accounts may be added at a later date if the monthly report can be produced faster and more efficiently than at the present time. If there are questions or comments about these procedures, contact the Log-in Unit electronic mailbox DENLOG.



*Peggy Omara-Lopez*

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## District estimates for sample income

The NWQL would like to thank all of the Districts for their responsiveness to the request in January for estimates of sample income. Participation was 100 percent! Kudos go especially to the Northeast Region for responding in advance of the deadline; it was the first Region to have all of its Districts accounted for.

As a reminder, the deadline for the next response is April 18. Once again, please provide totals for the entire fiscal year, not just from April through September.

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## Recycling of glass pesticide bottles investigated

During the past 6 months, the NWQL has had several inquiries regarding recycling and reuse of 1-liter amber-glass pesticide bottles. The feasibility of a nationwide recycling effort was investigated. The NWQL supplier, Great Age

Container Corporation, and the manufacturer, Owens-Brockway Glass Company, were asked if the quality of the glass could withstand recycling. Owens-Brockway stated that these bottles are intended for one-time use only, and repeated use assigns liability and responsibility to the consumer in the event of failure.

The Laboratory Operations office also investigated the possibility of using a higher grade glass bottle that could be recycled. This proved to be cost prohibitive because a special mold would have to be manufactured at a cost of \$40,000, and the Laboratory would have to purchase a minimum of 250,000 bottles per order.

On the basis of this information, reuse of the pesticide bottles is not practical. However, investigators in the field should send used, clean bottles to a recycling center if such a facility exists at their location.

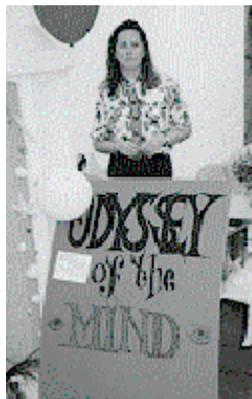
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## Psst--Ya know Brooke?

Brooke Connor was living in Socorro, New Mexico, with her family when she looked into attending graduate school. She discovered that the nearby New Mexico Institute of Mining and Technology would not only accept her but also hire her and pay her tuition to their school. She enthusiastically took her Master's degree in chemistry there. Now she performs organic chemistry for the NWQL. Brooke supervises the Gas Chromatography Unit. She is widely known for her work in volatiles and also for her involvement with NAWQA Sediment and Tissues.

So much for the work-a-day world. Now--how many of us would like to take a mind trip with a bunch of kids?

Brooke doesn't shrink from that at all! For the past 4 years, she has counseled teams through "Odyssey of the Mind," a creativity competition for school-aged children. The concept sounds simple: all the teams are assigned the same project, are given a set of requirements the project must meet, and are turned loose to solve the problem as best they can. For instance, they might be told to build a dinosaur that growls and wags its tail. The counselor must encourage the students to complete the task without offering any solutions. Brooke says she really has to be careful not to come up with ways to guide her teams. She empowers her students to brainstorm, persuade, and cooperate; she is evidently quite effective since her teams have taken the highest creativity awards locally for 3 years and have placed first in Regional and third in State competitions.



***Mindful of Others** – Brooke Connor, chemist and supervisor of the Gas Chromatography Unit, created an "Odyssey of the Mind" display last spring as part of the USGS Open House at the Denver Federal Center. The Odyssey program teaches children to be creative.*

As if a job and community service were not enough, Brooke also contributes original craft designs to benefit the Nutcracker Ballet in Boulder. She fashions whimsical sculptures from "just a gob of this, plus a snitch of that" (for example, clay, beads, and feathers). She confesses she's been known to snag neighborhood children to learn and help her with crafts when her boys Ryan, 14, and Patrick, 11, are busy with other projects.

Brooke is a high achiever and yet a modest person; she works hard, but seeks no accolades. And she would be mortified to learn how much we at the lab respect and admire her talents and personality; so--don't tell her!



*by Karlin Allen*

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## NWQL methods off the press and available

Recently published method reports are available by writing directly to the National Water Quality Laboratory or by sending electronic mail to KIALLEN. New titles published since the last edition of the Newsletter are as follows:

Werner, S.L., and Johnson, S.M., 1994, Methods of analysis by the U.S. Geological Survey National Water Quality Laboratory--Determination of selected carbamate pesticides in water by high-performance liquid chromatography: U.S. Geological Survey Open-File Report 93-650, 20 p.

Brown, G.E., and McLain, B.J., 1994, Methods of analysis by the U.S. Geological Survey National Water Quality Laboratory--Determination of antimony by automated-hydride atomic absorption spectrophotometry: U.S. Geological Survey Open-File Report 93-664, 17 p.

Markovchick, D.J., Lewis, J.A., Brenton, R.W., Iverson, J.L., and Wharry, H.L., 1994, Methods of analysis by the U.S. Geological Survey National Water Quality Laboratory-Determination of triazine and other nitrogen-containing compounds by gas chromatography with nitrogen phosphorus detectors: U.S. Geological Survey Open-File Report 94-37, 17 p.

Pratt, L.K., 1994, Using analytical services at the National Water Quality Laboratory: U.S. Geological Survey Open-File Report 94-26, 15 p.

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## Son born to the Burkhardts

The acting chief of the Organic Chemistry Program, Mark Burkhardt, is taking family leave to head up a diaper brigade with his wife, Andrea. They are the new parents of Vincent, their first child, born March 2, at 5 pounds and 2 ounces, and 20 inches long. Mark reports that all are in good health.

Family leave is a new program. Employees may take up to 12 weeks without pay. Mark will be in and out of the office for 6 weeks. In his absence, various supervisors are rotating the duties of acting chief.

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## Transfer of field-supply operations underway

A portion of the National Water Quality Laboratory field-supply operation is being transferred to the Quality Water Service Unit in Ocala, Florida. Final preparation is underway by Ocala to assume responsibility for these field supplies. Specific items to be relocated include polyethylene and glass bottles, preservatives, and sample-packing materials. The NWQL will retain responsibility for organic blank water, field spike components, and field spike mixtures. The NWQL will provide a monthly update via electronic mail to keep everyone apprised of where to order supplies.



*by Will Lanier*

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## Insights into sample handling and analysis at the NWQL

*What happens to the bottle after you put it in the mail?*

*by Ed Furlong*

Methods Research and Development Program

**Editor's note:** This column contains questions that originally were put together as part of the WRD training class "Water Quality Principles." Through this question and answer format, Paul Capel (Minnesota District) and Ed Furlong (Methods Research and Development Program) answer some of the more common questions WRD personnel ask the NWQL. Additional questions and answers from this course will be printed in subsequent columns. If you have a question about the Laboratory, please send it to EFURLONG on EDOC. Selected questions and answers will be printed in future columns.

### **Q. Do I really get MY ice chest back from the NWQL? How do you do it?**

Voodoo. No, really, what we request is that you put a label in the cooler which has your return address, Project I.D., and Project Account No. (yes, you are charged for return shipping). You should also permanently label your cooler with your District address, so if a return label is not included, we can eventually get the cooler back to you (and bill you, too).

### **Q. The bottles from the NWQL are pretty expensive. Why can't I just go out to the supermarket and buy some clean bottles?**

There are several reasons. First, the containers the Laboratory provides are the best for shipping and preserving samples, for example, amber-glass bottles for pesticide samples. Second, if it is required, the sample bottles are pre-cleaned prior to shipment to remove contamination that remains in the bottle after shipment from the manufacturer. This is particularly important for analysis of trace concentrations (acid washing for trace elements, prebaking of bottles for sampling organic pesticides). Third, the cleaned containers are checked by the Quality Assurance Unit (QAU) to ensure that the cleaning procedures are effective.

### **Q. How many samples do you get each day? How on earth do you keep track of them? And what do you do with the empty bottles?**

Depending on the time of the water year and budget year, the Laboratory receives anywhere from 20 to 2,000 samples per day. These are tracked by labeling each sample with a unique log-in identification, which is a nine-digit number. For example, 931230025 is the 25th sample logged in on Julian date 123 (May 3rd), calendar year 1993.

Both plastic and glass bottles are recycled, but only after samples have been analyzed, and in the case of inorganics, all quality-control checks have been passed and no reruns requested within 6 months from sample log-in. If preservatives were used, bottles are decontaminated prior to recycling.

**Q. Some of the water samples are put in glass bottles and some in plastic bottles. It's all the same water. What gives with the different kinds of bottles?**

Different bottles are used for different analyses. In general, plastic bottles are used for inorganic constituents, and glass bottles are used for organic constituents. One reason is that there are effective, inexpensive means for cleaning each of these container types, for example, acid rinsing for polyethylene trace-metal sample bottles. Another is that even with extensive precleaning, contaminants or interferences, or both, will leach out of sample containers; so we use bottles that will least adversely impact the analysis of interest. If inorganic samples were shipped in ordinary store-bought glass bottles, for example, major and trace-element ions would leach out of the glass, resulting in abnormally high concentrations. If plastic bottles were used for organic compounds, first, we could not clean them effectively, and second, we would have plasticizer contamination leaching into the water samples, which would interfere with the analysis.

**Q. Samples are wrapped, packed in ice, and sent overnight mail. What's all the fuss since that water has already been in the stream or aquifer for quite a while?**

Once the sample is removed from the aquifer, lake, or stream, biotic or abiotic degradation can occur, even in the presence of preservatives. Volatile components can outgas, even with tight sealing. Biotic degradation is promoted by the bottle surface which bacteria can colonize. If exposed to light, photodegradation is enhanced. And all these processes are favored by increasing temperature. The precautions taken in sample shipping ensure that the sample is received in as close to its original condition at the time of collection as possible.

**Q. What's the deal with "holding times"? Is the water going to spoil?**

No, the water will not spoil, but there can be losses of analytes, particularly volatile organic compounds. We can not stop loss processes, but by shipping the sample under the conditions described in the previous answer to the question and by analyzing them as quickly as possible, we minimize the impact of losses on the final result.

**Q. I learned in this class that all water must be electrically neutral, so I know that there are sodium and chloride ions in the same water sample. Why in the world do I have to send in two plastic bottles to get these two analyses?**

The NWQL groups the analysis of individual constituents by chemical type and by the analytical technique used to make the determination. Sodium is determined by flame atomic absorption spectrophotometry or inductively coupled plasma-optical emission spectrometry, while chloride is determined colorimetrically in a segmented-flow analyzer. Also, the sample bottle for the sodium analysis must be acid-rinsed. Since the different constituents require different bottles or pretreatments, separate bottles are required. Even if this were not so, it would be more reliable and provide faster sample throughput to provide two samples, since they are analyzed by different work groups within the Laboratory. Note that for most organic schedules and for many inorganic schedules, multiple constituents are analyzed from a single sample.

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## **Merle Shockey on the mend**

Merle Shockey, chief of the Inorganic Chemistry Program, returned home from the hospital March 14 after suffering a heart attack March 8. He is undergoing an 8-week rehabilitation program with increasing levels of exercise to repair a damaged heart muscle. The prognosis is excellent.

Merle says he is on a low-fat diet. He is slowly increasing his exercise regime in favor of cardiovascular, rather than strength, fitness.

The heart attack involved a single blocked artery. The artery was lined with cholesterol, which cracked loose and caused a clot to form, damaging an area of heart muscle. Doctors said the rest of his arteries are in good shape.

A few reminders are helpful:

- Heart attacks are often confused with indigestion or gas. If experiencing these symptoms, do not delay going to the hospital or dialing 911.
- Call your hospital in advance and ask what the waiting time is for treating victims of heart attack. It should not exceed 30 minutes; in some hospitals, the wait may be as long as 2 hours.

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## Future regulatory work at the NWQL

The NWQL is concerned with meeting all data-quality objectives of its many customers in the Water Resources Division (WRD). The Laboratory is aware of its customers' needs to measure a wide variety of contaminants in hydrologic systems using WRD-approved analytical methods. These methods typically are geared to natural water that is not severely impacted by anthropogenic factors, are reported through the Division-wide computer system, and were not designed to meet regulatory requirements.

Over the past several years, many WRD customers have requested services that must be met using regulatory methods. Some of these services have been met by instituting methods approved by the U.S. Environmental Protection Agency, and some have been met by contracting with laboratories that routinely use various USEPA-approved methods. In order to meet these customers' needs more directly, a team was formed to define how the Laboratory could prepare to meet all requirements of major USEPA programs that drive regulatory methods.

The Laboratory now has a feasibility study that outlines the requirements, equipment costs, and personnel requirements to put these methods on-line at NWQL. The Laboratory is proposing to implement the National Pollution Discharge and Elimination System (NPDES) analytical requirements under the Clean Water Act in response to various needs, including the Military Storm-Water Runoff Program under Fred Quinones. Systems are being implemented that will result in meeting all the requirements for the Contract Laboratory Program for both organic and inorganic methods because the other USEPA programs are included in those requirements. The NWQL will offer these services to its customers only after the Laboratory and USEPA are convinced that the NWQL can succeed in the work and produce all the data in appropriate report formats.



*by Pete Rogerson*

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## Seminar schedule updated for Laboratory seminars

Graham Kimber, Queensland University of Technology, Brisbane, "Discontinuous Flow Analysis as a Sample Introduction System for Analytical Techniques," Jan. 27, 1994; Barb Ryan, Assistant Regional Hydrologist, USGS, "NAWQA--Past and Present," Feb. 2; Susan McGroddy, National Research Council Postdoctoral Fellow, "Partitioning of Polycyclic Aromatic Hydrocarbons and Polychlorinated Biphenyls between Sediments and Porewater from Boston Harbor," March 9; Alan Riggs, Central Region, USGS, "Devils Hole--The Source of a Major Geochemical Paleoclimate Record," March 18.

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