

New Assistant Chief on Board

Bob Williams joined the NWQL as assistant chief in October 1992. Williams faced some stiff competition for this new position but brought with him the expertise and connections that will continue to make the NWQL an asset to the Water Resources Division. Williams brings over 20 years of District experience to the position. He will be working primarily as a liaison to the Districts. Williams is expected to improve interaction and communication among the Laboratory, Districts, and other NWQL customers.

Large Bottles Discontinued

Effective October 1, 1992, the NWQL discontinued the use of 250-mL brown nutrient bottles. The Laboratory is replacing them with 125-mL bottles. This change will decrease the mercuric chloride in the environment. The policy will be flexible in that if the NWQL receives a 250-mL bottle, it will be processed and the District will be notified to discontinue using the larger bottles.

Lab Undergoes Facelift

A new quality-control laboratory for radiochemical, inorganic, and organic analyses has been built at the NWQL and is managed by the Quality Management Group (QMG). The radiochemistry laboratory area will be used primarily by QMG personnel to provide quality control of radiochemical analyses.

The inorganic section of the laboratory is used mainly for blind water sample insertion, preparation, and storage. The blind samples are submitted to the inorganic section for analysis after initial preparation. Nutrient, trace metal, mercury, precipitation, and blank water standards are all currently prepared and used in the new laboratory.

Method standards for organic programs are being established. Since the organic program is in its preliminary stages, standard preparation is manual. The laboratory is also being set up for organic use.

The blind sample program benefits the NWQL, especially in detecting analytical problems before data are released to the Districts. The blind sample program is an added independent quality check that complements quality control from the radiochemical, inorganic, and organic programs.

Computer Services Unit Develops Mission

The Computer Services Unit (CSU), under the direction of Steve Glodt, is improving telecommunication, hardware, program development, and training. One of the first steps is to reemphasize the mission of CSU as it relates to the NWQL.

CSU provides uninterrupted telecommunication and computer service as well as training, purchasing, and programming support. It assists in designing, configuring, purchasing, and maintaining state-of-the-art telecommunication links and computer systems to meet the many needs of the NWQL. CSU provides training in the use and implementation of the new DIS-II equipment. It also provides programming and maintenance support for the current Laboratory Information System and will have a direct impact on setting up the replacement system that is needed to bridge the gap between the old technology and the newer UNIX-based system.

In addition, CSU is involved in implementing Total Quality Management (TQM) concepts for personnel. Recently, a TQM team was formed by the Automated Data Processing (ADP) group to design and implement a Novell Local Area Network. The group was led by the ADP telecommunications specialist, Diane Moffett. Novell is being introduced at the NWQL to

more efficiently integrate the many personal computers that are needed to run the analytical data instruments and to provide greater flexibility in using diverse computer platforms.

A unique function of CSU is the data entry point for the Analytical Service Requests. Samples are sent to NWQL for analysis from the many Water Resources Division Districts throughout the United States. Once the samples are received, the requests are computerized. Computer printouts are sent to CSU where they are estimated, verified, and entered into a computer. This procedure may lead to informal training for the people who send in the samples as well as the NWQL technicians. After the testing is completed, CSU enters any missing values, changes values, and verifies values. Sometimes, requests are added and analyses are redone. The CSU also is involved in the pilot testing of the Sample Management System Program. As the NWQL becomes more and more automated, this intermediate step may evolve into a complementary function for the new Laboratory Information System which is under development.

NWQL Mission Statement

The U.S. Geological Survey, National Water Quality Laboratory, fulfills analytical requirements of the Water Resources Division by analyzing environmental samples for inorganic, organic, and radiochemical constituents. The NWQL strives to provide high-quality results in a timely, cost-effective manner. To meet established quality objectives and to support District water-quality investigations, the NWQL provides project planning and data interpretation assistance. The Laboratory also develops new analytical methods and sample collection procedures as needed by the Division.

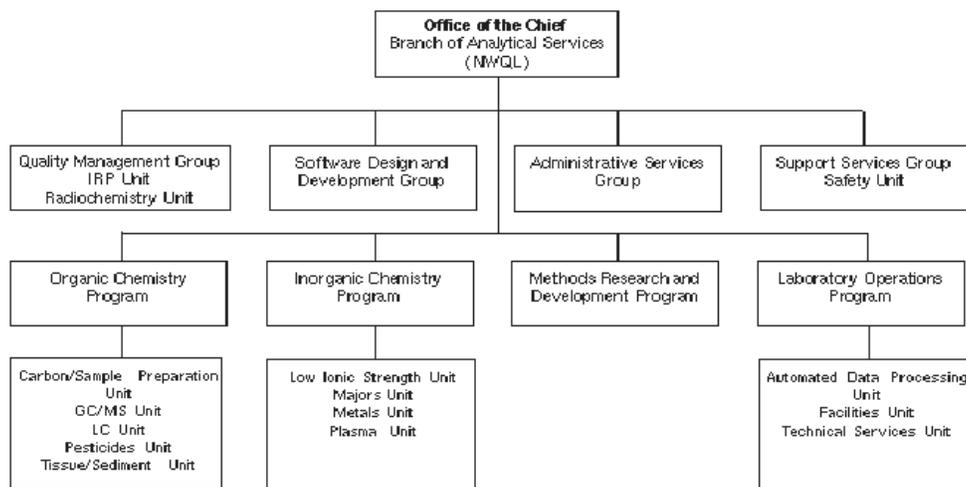
Warehouse Tracks Inventory

The Supply Management Unit of the National Water Quality Laboratory (NWQL), under the direction of Will Lanier, has implemented a warehouse inventory control system. The warehouse maintains an extensive inventory of materials and office supplies. In this cost-containment climate, Lanier has adopted the Computer Associates' ACCPAC software package for development of an in-house inventory system using the new Distributed Information System (DIS). The system is 95 percent computerized and provides management with the ability to track supply use and to reorder.

The efforts of the warehouse mirror a national trend toward efficiency in cost accounting and inventory control. The private sector has long realized the importance of real-time access to inventory. Now, the NWQL warehouse is using new concepts to streamline, manage, and develop a cost-accounting approach that will provide a building block for the systems in use at the Laboratory.

Pratt Named Technical Operations Chief

Linda Pratt assumed the position of Technical Operations Chief in August 1992. Technical Operations consists of the Log-in Unit, Warehouse Operations, Computer Services Unit, and Facilities Unit. Linda has been employed for several years as a supervisory chemist in the Inorganic Chemistry Program.



Organizational chart for the National Water Quality Laboratory

New Method Approved for Determining Trace Metals

Inductively coupled plasma-mass spectrometry (ICP-MS) has been approved as a method to determine dissolved trace metals in water samples. This method of trace metal determination was developed by Lynda Faires formerly with the Methods Research and Development Program at the NWQL.

Dissolved concentrations of trace metals in water samples at present are determined by either graphite furnace atomic absorption spectrometry (GFAAS) or inductively coupled plasma-optical emission spectrometry (ICP-OES). The use of ICP-MS has the advantage of a low detection limit comparable to GFAAS and a multielement capability comparable to ICP-OES. This new technique will enhance the analytical capability of the NWQL to fulfill requirements of the various District programs. The ICP-MS method can be used either as an alternative or as a supplement to existing methods at the USGS for the determination of dissolved trace metals in water samples.

In addition, ICP-MS has proved to be a reliable analysis method to determine trace metals in biological material. Biological test samples analyzed by ICP-MS have shown that this technique will allow the determination of trace metals in tissue not previously determined at the NWQL. The use of ICP-MS to determine trace metals in biological materials will greatly enhance data for the National Water Quality Assessment Program. For information, please contact Jerry Hoffman or Ed Zayhowski at the NWQL.

Rerun Project Streamlined

The QMG is automating the District rerun process. The primary goals of this project are to speed up the processing of rerun requests from District customers. Currently, QMG receives electronic mail (EDOC) at the address DENQC. The person who is doing District reruns must read every mail request and determine if the request is correct or incorrect by checking it against the PR1ME data base. EDOC's are sent out to Districts that have a mistake in their request for reruns. EDOC's also are sent out to Districts when a rerun request has been completed, containing the original request information and the new value for the analysis. Once a request is accepted as correct, the person doing District reruns manually enters the information from the EDOC into an ENABLE data base.

The District rerun automation project will speed up the processing by using the Data General as a mail forwarding location for QMG. All EDOC's received by DENQC will be forwarded to the Data General for daily processing.

The EDOC software will be programmed to look for date errors and problems in format in the District rerun request. If the program finds these errors, it will send the request back to the District with an explanation of the problem and how to fix it. This software will speed up the processing of the District reruns and should make life easier for the Districts.

QMG Assesses Mission

The mission of the Quality Management Group (QMG) at the National Water Quality Laboratory is to assess and ensure data quality for Districts and laboratory analytical support programs by data review, quality audits, and process evaluation. The QMG strives to meet customer requirements through active communication, education and training, WRD support, and problem resolution.

To meet this mission, QMG is involved in numerous activities to ensure quality of the data. The inorganic quality management program has several responsibilities: (1) data initially are reviewed by a computer program and then are reviewed by a chemist if the analysis fails the program (see NWQL Tech Memo 93.02 for details); (2) District rerun program facilitates requests from Districts for reanalysis of samples; and (3) blind sample program checks the quality of the analytical lines and entire sample flow process by blind submission of standard reference water samples to many inorganic analytical lines. The primary contacts in this program are Kathy Bryant, Beth Kellogg, and Kailin Terry.

The organic quality management program is just starting, and the Organic Program, QMG, and Methods Research and Development Program are working as a team to determine the most critical areas to concentrate initial efforts. At present, much effort is being focused on finalizing standard operating procedures for the program. Kim Pirkey, Jeff Pritt, and Carmen Reed-Parker are the QMG representatives in this program.

The QMG is developing statistical applications to quality management in the NWQL. An emphasis on statistical process control for the analysts is a critical goal for the NWQL so that many accuracy or bias problems in the data can be detected immediately by the analyst. Moreover, additional statistical summaries of quality control information will be prepared for

internal and external use. Jeff Pritt is responsible for developing the statistical approaches, and Bruce Allen is responsible for automating many of the programs.

The QMG is responsible for the Installation Restoration Program which contracts samples from highly contaminated sites with the U.S. Department of Defense to Rocky Mountain Analytical Laboratory and other ENSECO laboratories. Dorothy Walker and Ralph White are coordinating this program.

Jon Raese is the new technical publications editor and reports specialist for NWQL, and is responsible for the newsletter. Ann Watterson is responsible for parts of the catalog and for the parameter and laboratory codes. Sherry Gee, secretary, holds all the pieces together, and Nancy Driver, chief, stirs up the pot most of the time. The QMG is in a stage of growth. Customer feedback is encouraged as the QMG strives to improve services and meet client needs.

Method Developed for Automated High-Speed Low-Level Total Alkalinity

A new analytical method has been developed by the staff of the NWQL for the routine determination of total alkalinity in natural-water samples by automated titration using second derivative inflection-point detection. The new technique and instrumentation are being used by analysts of the Low Ionic Strength (LIS) Section of the Inorganic Program.

The previous method for determination of total alkalinity had a detection limit of 0.5 milligram per liter as CaCO_3 in water having a conductivity of 100 microsiemens per centimeter or less. Unfortunately, determinations by this method required up to 2 hours per sample, and false end points occasionally were obtained for certain types of samples.

The new method is designed so that the conductivity of a given sample is used to customize or adjust instrument sensitivity to match the expected alkalinity. The instrument uses three levels of sensitivity to accurately detect inflection points for samples with total alkalinities ranging from 0.2 to 100 milligrams per liter as CaCO_3 . The increased instrument sensitivity makes it possible to automatically control the sample dose rate, titrant addition rate, curve smoothing, gain, and relative background noise. The result is accurate detection of titration inflection points, elimination of false end points, and lower detection limits. The new method also is as much as 7.5 times faster than the old method. For further information, contact Carl Harris in the LIS Section.

Organics and QMG-A new team effort

The Quality Management Group (QMG) and the Organic Program at the NWQL have started a cooperative effort to evaluate and improve current QA/QC practices. The focus of these efforts is being defined by a Quality Improvement Team (QIT) that was formed in July 1992. The team is comprised of three members from the Organic Program, two from the QMG, and one from the Methods Research and Development Program.

The QIT at present is auditing the Sample Preparation, Standards Preparation, and Analysis areas. The team will make recommendations to senior staff for approval. One area under discussion is the development of data packages for customers. The goal is to provide information concerning surrogate recoveries, spike recoveries, and matrix spike recoveries for the entire sample set. Access to all the available QA/QC data should help customers to understand their analytical results.

The QMG is working with the Organic Program to improve documentation, sample tracking, and the availability of on-line reliable QC data. The QMG also is dedicating resources to implement Statistical Process Control (SPC) at NWQL. SPC will improve the efficiency and the accuracy of results by targeting the sources of greatest variability and then improving on them.

The QMG is pursuing the development of many other organic QA/QC programs. Future plans include the implementation of internal audits, a blind sample program that will supplement the efforts of the Branch of Quality Assurance and an in-house QC data review program. Although many of these programs exist informally throughout the NWQL, their standardization will improve the quality of organic data produced at the Laboratory.

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